The Iron A

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Single Spindle Foot Drill.

Among the new tools which the Pratt & Whitney Company, of Hartford, Conn., are manufacturing is the Single Spindle Foot Drill, which we illustrate. The table of this maehine is raised solely by the foot actuating a treadle, which, by means of a connecting rod inside the hollow column, engages with a horizontal lever, the outer end of which is yoked to embrace a collar on the supporting slidingbar of the table. The table has an extreme verticle movement of three inches, which may be reduced, by means of a screw and check-nuts, to any less distance desired. The cone has four grades of speed, carrying a one and a half inch belt. The spindle may be run at a very high rate of speed, there being no danger of its heating. Small drills of this kind have become almost a necessity in the shop. This neat and handy tool seems in every respect to meet the requirements of the shop.

American Institute of Mining Engineers.

The following are abstracts of papers and discussions at the June meeting of the Institute, held at Philadelphia:

TECHNICAL EDUCATION.

osis of the discussion at a joint meeting of the erican Institute of Mining Engineers and the erican Society of Civil Engineers, June 19. The address of Mr. A. L. Holly, president of the Institute of Mining Engineers, at its Washington meeting last February, and the discussions on the same, evoked a widespread interest, and created a desire for a further and more elaborate discussion of the subject. The meetings of the two societies above named at the same time at Philadeiphia, seemed to offer the requisite opportunity for such a discussion. The added fact of the presence in the city of a large number of foreign gentlemen, interested

in a greater or lesser degree in technical educa-

tion, gave to the discussion a greater value. The joint convention was called to order by Mr. A. L. Holly, the president of the Institute, and on motion, Prof. R. W. Raymond was called to the chair. In opening the discussion he said there were two classes of technical education-the education of students for the engineering profession and that of the workingmen. The evils of trades' unions, and that system known as a division of labor, by which a workman was restricted and kept down to a particular specialty were strongly denounced. These specialties or divisions of labor interfered with the progress of the education of the workingman, because as he became more valuable to his employer it became the interest of the latter to prevent his rise beyond the point he had already attained. Reviewing the different systems of education, the speaker alluded to the teaching of drawing, and other elements of technical education, in the Cooper Union schools of New York, with their 1500 workingmen students, which studies emancipate them from the monotony of their occupations, and give them both the ambition and the power to rise into new and influential positions. If this course was generally applied, engineering superintendents would be selected from among workingmen. The speaker went on to demonstrate, among other phases of the subject, the

for the student of metallurgical engineering. Mr. Thomas C. Clark, of Philadelphia, of the Society of Civil Engineers, being called upon by the chair, contributed a valuable paper upor the theory of education in practical, civil and mechanical engineering, showing the distinction to be made in the treatment of the two classes of students, viz., those of executive ability, having a turn for the administration of affairs, and those of a scientific bent, inclined to find the reason for everything.

necessity for a general and practical education

Capt. Douglass Dalton, of London, being next called upon, spoke of the experience of practice can be obtained. To his mind, practhe India government in the establishment of a London, as showing the difficulty of inculcating by means of a school a practical knowledge of the science. The system in the school had been much like that which bad already prevailed in India, under which officers of engineers who had been educated theoretically had acquired their practical knowledge at the expense of the government. But the rule in England is for civil engineers, first of all to receive a somewhat liberal education in college, and then to go as pupils to the leading chief which they settle themselves on their own basis. Mechanical engineers invariably go as ing ability. pupils into the shops of leading machinists, to a young man, it would always depend upon of an engineer. the young man himself as to whether he makes an engineer or not.

can be applied to engineering. A lengthy disof men, which was to be attained only by starting at the bottom and going up through every department, was held by Mr. Pechin, of the Dunbar Iron Works, to be essential to the training of the engineer.

Coleman Sellers, Esq., of Philadelphia, spoke of what was almost the first act of the Franklin Institute (founded 50 years ago by some earnest mechanics) in establishing schools for drawing. These, for Philadelphia, and from them sprang could be more speedily learned. the present School of Design for Women. An examination of the free school system of at Worcester, Mass., held that theory and practhe utmost difficulty that free hand drawing was fied in the success of the institute with which pencil on the paper, expressing in form what were educated in the machine shops and in the we desire to explain. If that language was academy, time being devoted to each. Thus universally taught the workingmen would be with the theoretical was acquired a practical erous substances (coke, authracite, car-

better off. But, unfortunately, the education of the schools was directed toward making our young men accountants or giving them an idea of being doctors or lawyers. Not one word was taught them as to the meaning of a monkey wrench or the other tools of machine shops. This under-lies the whole trouble in the common schools of America. If the students were given a knowledge of drawing or something of tech nical education, though in its crudest form, they would beready for something higher. Leaving the free schools, they are taught in the high schools and in night schools something of drawing and the exact sciences, which is undoubtedly useful. The speaker went on to give from experience in the training of his own sons some valuable advice to parents desiring to make engineers of their youths.

Mr. Ashbel Weich, of New Jersey, in reference to the high and responsible standing of the engineering profession, referred to the comparatively enormous proportion of the lands of the United States, which was owned by railroads, controlled by a few hundred men, who were mainly engineers. If stockholders could feel assured of strict integrity among the engineering class, then the railroad stocks would rise from 10 to 20 per cent.

training.

Roberts also participated in the discus- ness ideas easily instilled in youth. I. Holly, believed that the strict curriculum of the school had become noxious, and that technical education had become so directed as to make the student learn from nature. He did not think that a complete knowledge of engineering could be formu-

Mr. Alfred P. Boller, of New York, spoke in favor of studying from nature, where the best tice, and not theory, makes the engineer. The school for engineering at Coopers' Hill, near present system of graduating young men and calling them full-fledged engineers, was a farce. An engineer is only entitled to the name after a long practice, such as would qualify him to act as assistant. Too much attention is given to abstract mathematics.

Mr. Eckley B. Coxe thought a certain amount of æsthetic culture was requisite to make an engineer. A liberal education, to him, seemed to be necessary before a young man should go into a shop. The student should be thorough ly grounded in physics and in mathematics engineers for a specific time. From that state The object of the school should not be to pupilage they pass into some system by graduate the greatest number of engineers but to turn out the greatest quantity of engineer-

Mr. William P. Shinn believed that the and as a rule pass through every portion of the science of accounts should be grafted in the mechanical work in those shops in detail, in- education of engineers, as it is as necessary to cluding the drawing room. The speaker con- him as to the lawyer. A dislike of business cluded that, however much attention was given forms detracted considerably from the worth

Prof. Eggleston, of Columbia College, New York, stated his views at length, holding that the meaning and signification of a word at pleased if this paper guides to a certain inti-Dr. Wedding, of Berlin, the next speaker, in a high preliminary education was essential to will. In a language that is not original, but describing the mode of instruction in Ger- success. He would have the student well edu-

many, said that a good preliminary education cated in the languages, especially the German, assimilate and exchange. As an illustration of Partial reconstruction of A furnace Cruis requisite for admission to the academies as from the text books and writings of men of this. I refer to that word, the meaning of which where engineering is taught. The students are that country he could glean a vast deal of use is occasioning so much discussion at the presaces, or smelting establishments, and are then universal language, that of free-hand drawing, carried through a full course of instruction, as it may be called. The system of "forcing mbracing all the branches of science which things," as he termed it, and making practical men out of green college students, he deprecussion followed, each of the speakers being cated severely, and said one of the greatest faults may give us a right to ask that this definite salled upon by the chair. A practical insight of the colleges of the present day was that into the details of the profession, a knowledge they strove to graduate too many students at so, and in this way a quantity of diluted intellect, which did no one any good, was diffuseda source of annoyance to the student himself. The trouble with the present system of education was that the practical was left out in

teaching the theoretical.

Mr. Robert W. Hunter, of Troy, N. Y., was management of works to introduce engineering many years, were the only drawing schools classes, by which means the practical details

Prof. C. O. Thompson, of the Free Institute this and other States would show that it was with tice must go hand in hand, a principle exempliversal language of the world, the language of carry out the idea. The students, all young, poses, and the second, to separate the reduced

first given a practical training in puddling fur- ful knowledge. He would also impart the ent day, "stahl," in English, "steel." This word in German always conveys the idea of a substance that can be hardened. As the German literature in relation to metallurgy is the oldest of the modern world, this circumstance meaning may be considered in settling the precise meaning of this word. However, as one time, because some rival or a neighbor did the four peoples, German, Swedes, French and English, compete in the richness of their metallurgical literature, it is very necessary to reach a uniformity in the nomenclature of iron. that would prove useful not only for scientific purposes, but equally for trade. For this purpose, I propose to make such divisions of iron that the word steel shall be used only as apconvinced that it would be advantageous to the plicable in a very inferior range, not as formerly in the first order.

Nature furnishes us iron mostly in the state of oxides, or if otherwise, these minerals must be reduced to this state in order to work into iron. The oxides are always mixed with certain substances, which may be colled rocks. This necessitates, in the first instance, two processes, introduced. The foundation of all education he was connected. Having an endowment one to reduce the iron and give it the right (the speaker held) was that which was the uni- fund of \$600,000, there was sufficient money to amount of carbon necessary for technical pur-

> bonic oxide, etc.), and gives, in accordance with the amount of heat used, either a malleable iron or a non-malleable iron. The process of making malleable iron in this way is called generally the direct process, such as that of Mr. Blair, in German, ren-narbeit. It produces the iron in a solid state, and a fluid cinder. By this process our ancestors made all their iron, and it has been tried to make iron in the same general way, but by different modes, in recent times, but, so far as I know, without making it a commercial success. The product of this method we call renneisen with the sub-divisions renneisen and rennstahl, for which I propose in English the name run iron, French, fer de louf. With a larger amount of heat you get an iron, which is too rich in carbon to be malleable. This is generally called pig or cast irou (roh or gusseisin) French, fonte or fer fondu, and is made in the blast furnaces, rocks and iron being separated, both in a fluid state. There could be a third method, namely, to let the rock remain in a solid state, and make the iron flow. This method is not practicable at present-The largest part of the iron used in the arts enters into them in the malleable state, and, therefore, most of the pig iron must be converted into that state. This is done by a process which

Integrity, he thought, was one of the idea of what they were being taught, learning takes out a certain amount of carbon, and most important elements to be inculcated in the quicker and the ideas remaining fixed. He ob- also some other substances, principally sili jected to practical training first, because as the cium. The processes, the three most exten being the charcoal fining, the puddling and the Bessemer process, are called in German frisch processe : English, fining : and gan, and Messrs. P. H. Dudley and Frederick for the product I propose frischeisen. English J. Slade, of Trenton, also participated in the fined iron-sub-divisions may be charcoal hearth iron and steel, puddled iron and steel, Bessemer iron and steel; French,

> It often occurs in these processes that by purose or by inevitable accidents the carbon is taken out to too large a degree, even to the extent of oxidizing the iron in some degree. these cases it is necessary to combine with the iron substances which either combine simply with the oxygen or combine with the oxygen and carbonize the iron. To accomplish this we have different processes, as for example, the converting process, which puts carbon into iron which is only heated, not smelted; but the way most used at present is to make pig iron, often spiegeleisen, or a similar substance, containing manganese or silicium, with the fined iron, in order to get rid of the superfluous oxygen and increase the amount of carbon. In these cases we have as a result a molten product. Therefore, we call this product in German flusseisen, with the subdivisions of flusseisen and flussstabl, and I propose in English, the name of flow iron or ingot iron. French, perhaps, fer coute or fer de l'ingot.

If desired, fron can be made by any one of these processes containing any degree of carbon; as, for example, Parry made cast iron and fined it by the Bessemer process, or run iron can be smelted with pig iron. This makes no difference with the nomenclature. I shall be mated nomenclature, which, in my opinion, is beginning to be imported, their future was

CIBLE WHILST IN BLAST AT QUINNIMONT FUR-By J. H. Bramwell

Mr. Bramwell begun by lamenting that furcemen did not oftener note down and publish the methods they have adopted to overome the practical difficulties they have met with in their experience.

The Quinnimont Furnace, he proceeded to state-60x15-had been in operation but two months when it became necessary to draw the tuyeres out a distance of 18 in. in order to give them a resting place, the brick-work under them being completely cut away, so that after each east they would sink from 6 to 8 in., requiring a loss of from 1 to 11/2 hours in raising and re setting. The tuyeres had been intentionally retained in their original position as long as practicable, in the hope that the cutting out would be retarded. This, however, did not prove to be the case, the process of destruction ntinuing as rapidly as ever.

The original thickness of the crucible wall.

ft., was now reduced to 18 in., and breaking out of iron was a frequent occurrence. As a still further protection, a wall of brick was carried up encircling the hearth with an annular space of 3 in., which was filled in with fragments of fire brick, upon which a constant stream of water was kept flowing at several points. This did not suffice to preserve the brick, for, at the expiration of a month the walls had become so thin that the tuyeres could not be maintained, even in their new position, without great loss of time in resetting. The quantity of fire brick and clay used in the operation eventually mixed in with the iron, so that the old experience of fire brick and iron not working well was repeated with monotonous regularity at each cast. The setting of the tuyeres finally culminated in one falling into the furnace, when it was decided to attempt to rebuild the hearth in sections and at intervals. A section of the crucible measuring 7 ft. on the outer circumference, 4 ft. on the interior and 48 ft. high, was first removed. Commencing at the open tuyere arch, the air was excluded and stocks held back with a heavy body of clay, tightly rammed with fire brick, and driven back simultaneously with the removal of the old work, and far enough to admit a 30 in. wall being set in with 15 in. blocks 6 in. thick, the entire operation requiring 30 hours. Quite a flow of cinder and some iron occurred as the last two courses of fire brick were raised, but was readily removed, and did not prevent a clear foundation being secured 6 in. below the level of the hearth bottom. Two weeks later a section 5 ft.x3 ft.x48 in, was taken out on the opposite side and rebuilt in the same manner; and later still repairs of a similar nature were carried out in the brick arch. A raising of the brick was anticipated but did not take place, and beyond a slight bulging no trouble was experienced. The furnace was kept very gray for several weeks, giving an excellent opportunity for the work to close up. The furnace was operated seven months longer without exhibiting any signs of weakness. Eventually, the cutting out of the boshes necessitated its going out of blast. On blowing out the renewed sections were comparatively intact, and the intervals of old crucible wall, between the new sections, had filled in and taken up.

ENDURANCE OF IRON RAILS. By W. E. C. Coxe, superintendent P. and R. R. R. Rail Mill, Reading.

In 1857 the P. and R. R. R. Co. made a coutract with the Fairmount Rolling Mill for the rerolling of some 4000 tons of iron rails. The sential features of the agreement were that the old rails should be piled with puddled from and rolled into flats for the rail pile, which latter was to be of a section seven inches square, and, after being heated and reduced by rolling to a bloom of a section about five inches by six was to be reheated before being finished in the rail of the T-pattern. Great care was exercised in the execution of this contract, and the rails being distributed over all parts of the road, gave general satisfaction by their excellent wear. Five years afterward the principal proprietor and manager of the Fairmount Rolling Mill was elected president of the Reading Railroad, and many of the rails made under his surervision were still in use in the tracks of the company. His first efforts were directed to procuring more rails of the same character. Makers refused to bid because of the details of the specification, mainly because of the price offered not paying for the labor and coal consumed in the changes made necessary by the departure from the established methods of working. Most of the new rails were, therefore, bought, and the old rails rerolled, without regard to any particulars as to the manner of piling, heating, etc., each manufacturer furnishing what he deemed the best article possible for the money.

The result was so unsatisfactory that the company determined in the latter part of 1866 to erect a rolling mill, and manufacture for themselves. As Bessemer steel rails were just Continued on page 15.1



SINGLE SPINDLE FOOT DRILL.

Professor Fairman Rogers and W. Milnor mind became older it grasped with less readi-sively used

Prof. J. H. Davis, of the University debate.

Mr. Ashbel Welch, of Lambertville, N. J., then moved that a committee be appointed to consider what steps are necessary to stop the practice adopted by technical institutions of issuing diplomas to graduates as civil engineers. This motion was heartily seconded, but no action was taken upon the suggestion, the president ruling that such a proposition could not be entertained because it was not clearly within the province of the meeting.

Before adjourning the meeting, the president, Dr. Raymond, of New York, summed up the discussion as having showed that a general knowledge of tools and mechanics was necessary before a student should enter into theoretical study. The conference was then adjourned.

ON THE NOMENCLATURE OF IRON. By Dr. Wedding, Berlin, German Commissi

Dr. Wedding introduced his paper by pleasantly alluding to the fact that its subject matter was not specifically scientific, but more general in its nature ; indeed, he might say it was international, and surely he could be excused for treating on a subject of that nature at this time. when Philadelphia was itself international. Contrary to the generally conceived idea that a German was warlike, his mission was that of a

peace maker. The German language is an original language, and it is, therefore, impossible to change combined, like the English, it may be easier to so very necessary.

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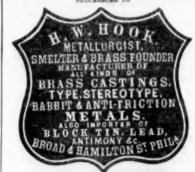
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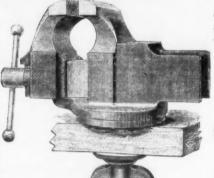
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Work.

stract of a Report to the Public Health Associa-tion of New York, by James C. Bayles, Chair-nan of Committee on House Drainage and Water

In the brief report which we have the honor to offer this evening, I shall present a few facts of interest which we deem of prime importance n connection with drainage and water service in bouses drained into sewers and supplied from public mains ..

It is because of the conditions with which we have to deal—especially those pertaining to foul and unventilated sewers, of bad construction and inadequate capacity-that the problem of sanitary house drainage presents so many practical difficulties. Were our sewers well ventilated, we should have a very simple problem for consideration. As it is, however, the difficulties are more apparent than real, for with good materials, good workmanship and adequate ventilation for waste pipes, experience has shown that it is possible to drain houses even into foul and unventilated lewers, without danger of bringing poi sonous gases into them. These three essential conditions of safety will be briefly considered in this report.

GOOD MATERIALS.

In much of the plumbing work of the time e see exemplified the worst evils of the conract system. Bids are made by competing plumbers on loosely drawn specifications; sometimes upon a close calculation of how little the work can be done for; sometimes with a knowledge of what others have bid; and some times with a reckless purpose to get the job by putting the figure so low that no one is likely to go lower-the bidder feeling certain that he sharp competition which now exists in the plumbing business enables builders to get lowed. work done very cheap by contract, and as work cheaply done is rarely worth more than is paid for it, we find a growing demand for cheap and inferior materials. It is not unusual to find iron soil pipe used which is utterly unfit for employment in buildings. We have seen pipe set up in houses which, tested with callipers, has been found to be not more than an eighth of an inch hick. The objections to this kind of pipe are numerous and important. It does not possess the requisite strength; it is too quickly eaten through with rust, and it is very apt to have and holes in it which soon develop points of leakage. The difference in cost between light pipe and that of suitable weight is not great enough to make the economy profitable. We learn upon inquiry in the trade that the principal demand is for very cheap and light pipes. As made, they are as hard as chilled ironowing to the fact that they are cust so thin-and most as brittle and difficult to cut as glass. If dropped they are very apt to crack, and in this condition are often put in by careless workmen, who are unwilling to report the fractures they have caused in handling, for fear they will be charged with the price of lengths to replace those broken. In much of the cheap work of he time we find 4 inch iron pipes used, which average about 8 lbs. to the foot. In good work, 4 inch fron pipe should weigh, at least, 12 lbs. to the foot. Pipes of this weight, well made of good iron, can be had in the market, and they should always be called

for by architects. In lead pipes the objections to light weight are baised chiefly on the fact that they are not durable, and are more readily perforated by

orresion than pipes of proper thickness. When cheap materials are tolerated at all by builders, we usually find them in all depart

nents of the plumbing work of a house. Among the worst evils of the present time ere the cheap pan and valve closets now generally used. Wrong in principal, flimsy in construction, and liable to constant derangement in their working parts, they are, as the rule, a perpetual source of trouble, a constant nuisance, and almost always a constant danger.

So long as the contract system is tolerated, so long will cheap material be used in plumbing work. If we force plumbers to bid below the cost of good work, we cannot expect them to lose money in executing their contracts. If we expect them to do a dollar's worth of work cents, we expect to cheat them, and we have no good reason to complain if we find that we curselves have been cheated.

We now come to the consideration of the second condition of safety-namely :

we now come to the consideration of the second condition of safety—namely:

GOOD WORKMANSHIP.

In New York there is no trouble in getting work done well, if we are willing to employ honest and capable men, who will demand a fair price. There are plenty of plumbers who know how to do good work, and will always do it if we give them a chance. In a consideration of the subject so brief and general as this report must necessarily be, your committee cannot point out what they believe to be the difference between good and bad workmanship in plumbing. To do this would be to present a complete manual of the plumber's art. We can only say that good workmanship can be had whenever there is a demand for it, and the difference in cost between good work and bad is far less than is commonly supposed. The most moderate bills for plumbing work we have ever seen—quality, durability and economy of retewals and repairs considered—have been those presented by pumbers who have been given a earts blanche to do work as they thought best.

In the judgment of your committee, the is-done the find the independent of the most moderate bills for pumbers who have been given a earts blanche to do work as they thought best.

In the judgment of your committee, the is-done the judgment of your committee the judgment

to the notice of your committee will serve to of sanitary reform.

Conditions of Excellence in Plumbing | show the effect of this system in lowering the standard of workmanship. In one of these instances a plumber working by contract had substituted three-quarter inch gas pipe for the lead pipe called for in the specifications in all positions where the fraud could be covered up and hidden. In another case the contract for plumbing work in a row of new houses was varded to a man who underbid all competitors. He did the work, and while it was not well done in any respect, it was accepted and paid for. The houses were subsequently sold and occupied, but it was not long before the foul and offensive condition of the celiars attracted attention and led to an investigation, which revealed the startling fact that in no case had my connection been made with the sewer. The oll pipe was carried down to the cellar and far enough underground to conceal the fact that it ended there. The drainage of the houses had been emptied into the soft "made ground" constituting the cellar bottom, and when the soil ceased to absorb it, the smell gave warning of the nature of the evil to be remedied. The architect had taken it for granted that the soil pipe would be carried out to, or in some way connected with, the sewer, but this was not specifically called for, and the plumber had taken advantage of this omission to save expense. These are extreme cases, and are only ased by way of illustration. We do not usually find dishonesty in the matter of workmanship carried so far, but it commonly goes far enough to give use to conditio is prejudicial to health, if not fatal to life.

In the judgment of your committee, the only emedy for bad workmanship lies in educating the public to an appreciation of the importance of good workmanship. Character and experience should count for something, and those who build houses must be willing to let the can make a profit out of it in some way. The plumbers make as large a margin of honest profit as mechanics in other trades are al-

VENTILATION FOR WATER PIPES.

The third and last condition of safety to which your committee would call attention is ood ventilation for the waste pipe system of a From the best information we can obain, we believe that the soil pipe of a house should be carried from the sewer to a point above the roof with but one bend, and without diminution of size in the upper lengths. We believe, also, that there should be no trap in the soil pipe at any point, and that the sewers hould be allowed to "breathe" through the pipes. When basins, baths or water closets are ocated in such positions that a long branch waste is needed to connect them with the soil pipe, said branch was e should be carried up and above the roof. The only exception to this rule is in the case of houses in which the plumbing work has already been done imperfeetly, and where leaks in pipes cannot be In such cases the pipe had better be closed. trapped below all house connections.

The importance of waste pipe ventilation seems to be very fully appreciated by sanitapublic. The idea seems to be that, as traps are specially intended to close waste pipes against an inflow of sewer gas, any further precautions taken to secure that end would be superfluous. This idea is, of course, a mistaken one, based upon a misconception of the conditions existing in sewers and the forces at work to displace, or saturate with gaseous impurities, the water seals in trais. From careful and repeated experiments made under conditions favorable to fair and unprejudiced judgmentexperiments which we should be glad to repeat in the presence of this essociation, when opportunity shall be accorded for a fuller and more comprehensive report-your committee are satisfied that but little dependence can be placed upon traps of the usual 8 or half 8 form. We have found that their tendency to become unscaled cannot be guarded against under any but exceptional conditions, and that additional ecurity is not attained by giving them more dip. This objection does not apply to all traps. however, and we take pleasure in calling your attention to a device of this description, invented by a skillful and intelligent practical plumber of Brooklyn, Mr. John Foley, which we are satisfied cannot, under any circumstances, be emptied or unsealed. The trap is adapted for use in all situations where traps are er barrier than those in traps of other forms and equal capacity to the passage of sewer gas by the process of absorption and transmission, it only requires to be supplemented by the ven-

anted by plumbers who have been given a corte blanche to do work as they thought best.

In the judgment of your committee, the isportant, incompetent and dishonest plumbers, whose work we see around us on every side, are the legitimate product of a pernicious system ecouraged by builders and tolcrated by the public, and that with the abolition of that system he will disappear from the ranks of the trade. Two or three instances which have come to the importance of the improvement of plumbers' materials which have come to the public, and that with the abolition of that system he will disappear from the ranks of the importance of improved drains; e systems and a desire for progress in the ill ection of sanitary reform.

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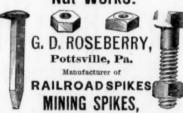
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We take the following abstract of new patents, recently issued, from the official rec-

CONSTRUCTION OF GROOVED ROLLS. To Emanuel Richards, Reading, Pa.-May 16. The roll is composed of two disks, which are formed with projecting surfaces, the said surfaces being ground off enough to bring the



groove back to its original diameter when it ecomes enlarged by wear. Agrooved welding and sizing roll, constructed of the disks C C'. provided with projecting surfaces D D, attached ogether by the bolts E E'.

CUT-OFF VALVE.

To Geo. F. Meyer, New York, N. Y .- May 16. The combination, with the rolling main valve B, having an exhaust cavity, e, and independent induction passages f f as described, of the externally adjustable hand plug or valve C, the induction and eduction passage h1 in the valve oox or case controlled by the hand valve C, and





also by the main valve B, the separate eduction passage ho, controlled by the main valve, and

177,326 .- Machine for Charging Retorts .- Wm. Foulis, Glasgow, North Britain.-May 16.

The machine is traversed on the track by hydraulic cylinders, pistons, connecting rods and gearing. The charging scoop is raised and owered by chains, drums, a worm wheel and tangent screw, and a hand wheel. It is projected into the retort, turned over, righted, and withdrawn by hydraulic cylinders, chains, pulleys, &c. Cranes are provided with chains, pulleys, &c., for raising and lowering the scoope into and from the charger.

177,327.—Apparatus for Drawing Retorts.—Wm. Foulis, Glasgow, North Britain.-May 16. The apparatus is traversed on its rails by a hydraulic cylinder having a rack bar, which works in a pinion on a shaft, which works bevel gearing on the axles of the wheels on which the machine moves. The rake is operated forward

and backward by water-power, and works in a hydraulic cylinder having suitable valves and 177,346.—Stop Valve.—O. E. McMurray, Lan-singburg, N. Y.—May 16.

177.351 .- Faucet and Funnel for Oil Cans. Frederick Ochs, New York, N. Y .- May 16. The faucet is detachably secured within s funnel formed in the can by means of a screw

threaded cup. 177,386.-Hammer.-Eugene A. Ely, Madison, N. J.-May 16.

The claws are made with sharp cutting edges at their extremity, to cut away the wood in which a nail head may be embedded.

177,437.—Steel Heating Furnace.—Wm. Swindell, Allegheny, Pa.—May 16. 77,443 .- Machine for Bending the Leaves for El-

liptic Springs,-Wm. M. Watson, Tonica, Ill.
-May 16. 77,447.—Saw Swages.—Calvin Adams, Russells-

burg, Pa.-May 16. The interior faces of the covering plates concide with the sides of the tooth at all points, and prevent the same from twisting while being swaged. All of the parts are held together

by a stirrup and key. 177,450.—Globe Valve.—Henry Atkinson, Pittsburgh, Pa.-May 16.

177,475,-Lathe.-Joseph F. Crawford, Cazenovia, N. Y.-May 16. 177,491.—Rolls and Conductors for Rolling Metals.

-Samuel C. Fox, Pittsburgh, Pa.-May 16. 177,492.-Anchors.-Frank Francis, Vienna, Austria.- May 16. 177.508.—Oil Well Tubing.—I. N. Hoadley.

Butler, Pa.-May 16. The well tubing is provided with openings below the water packing, for the discharge of gas from the lower part of the well to the in-

terior of the tube 177,529,—Auger Handle.—James Magers, Gervals, Oregon—May 16. 177,529. - Portable Derrick. - Shirwood Y. Beams,

Belleville, Tex.—May 16.
7119.—Machine for Rolling Metals—Reissued, Hervey Waters, Boston, Mass.-Patent No.

114,735, dated May 9, 1871.-May 16. 177.611 .- Latch and Lock .- Horace L. Arnold.

Grand Rapids, Mich .- May 23. 177,628.—Process of Annealing Cast Iron Skates. -Oliver Edwards, Florence, Mass.-May 23. 177,664 .- Looms for Weaving Wire for Coal

Screens.-Charles P. Seitzinger, Scranton, Pa. -May 23. 177,674.—Combined Door Rolt and Chain.— Wm. R. M. Adams, New York, N. Y .- May

177.692.—Steam Boiler, -Geo, H. Corliss, Provi-

dence, R. I.-May 23. 177,708 .- Hinge .- James K. Gilfillan, Syracuse,

N. Y .- May 23. 177,791. - Water Coil Steam Generators. - B. S. Benson, Baltimore, Md .- May 3. 177.811.-Noiseless Pawls.-Edward Curtis, New

York, N. Y.-May 23. 177,814 .- Pudlock .- Adolph Delkescump, Southington, Conn.-May 23.

177,846.—Key Fustener.—E. T. Jenkins, Brooklyn, N. Y.—May 23.

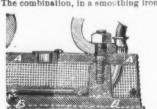
to the shank of the key by a set screw, pre vents the key from being turned by burglars' nippers on the outside.

177.883 .- Elastic Hanging for Revolving Ham mers.-Goldsbury H. Pond, New York, N. Y. -May 23.

SELF-HEATING SMOOTHING IRON To Mary P. Jackson, Kennett's Square, and Sarah P. Ball, Frankford, Philadelphia, Pa .-May 23 .- The inclination of the gauze promotes

draft. The coiled pipe projects the burning gas to the outer edge of the lower section. 1. The combination, with a smoothing iron composed of the upper and lower sections A B, of the gas supply pipe C, coiled on the lower section to project the flame on said sec

2. The combination, in a smoothing iron, of



the upper section and lower section with intervening space, and an interposed web of wire gauze surrounding and inclosing said

3. The combination, with a smoothing iron, of a wire gauze web, having a greater inclina-tion outward toward the front than at the rear

4. The combination of the upper and lower sections, the interposed wire gauge web, the gas supply pipe, having a series of burner openings, and an opening and cap for the ignition of the gas.

7124 .- Wood Screw .- Reissued .- Rich'd J. Nunn, Savannah, Ga., assignor to S. Elliot, New Haven, Conn. Patent No. 68,381, dated Sept. 3, 1867.-May 23.

In place of the usual nick, two slots or otches are formed, one upon either side, and with parallel sides oblique to the longitudinal axis of the screw. These slots converge and meet at the center of the upper surface of the screw head.

7125.—Apparatus for Crimping Wire for Sieves. Reissued .- Charles P. Seitzinger, Scranton, Pa. Patent No. 118,283, dated Aug. 22, 1871.

126.—Flue Cleaner.—Reissued.—Addison Cros by, New York, N. Y. Patent No. 156,543, dated Nov. 3, 1874.-May 23.

The following trade-marks were duly regis tered in the U. S. Patent Office 3670 .- Chuck for Drills .- The Victor Sewing Machine Company, Middletown, Conn.-May

3679.—Stencil Plate.—Samuel G. Monce, Bristol, Conn.-May 16.

"The representation of two hands, in the act of putting together interchangeable stencil plates or characters.'

3704.—Edge Tool.—Ten Eyck Axe Manufacturing Company, Cohoes, N. Y .- May 23. A symbol composed of figures of edge tools, with the name 'Ten Eyck' and letters 'Mfg.

3708.-Lock.-The Yale Lock Manufacturing Company, Stamford, Conn.-May 23.

"word 'Standard.' 3709.—Time Lock.—The Yale Lock Manufactur ing Company, Stamford, Conn.-May 23.

"word or title 'Yale." The following designs were duly patented in

the U. S. Patent Office 9309 .- Hand Wheel of Valves .- Edward G. Burn ham, Bridgeport, Conn.-May 23.-Term of patent 7 years.

9311.—Spoon and Fork Handle.—Le Roy S. White, Waterbury, Conn., assignor to Brown & Brothers, same place .- May 23 .- Term of patent 14 years.

An Important Decision in a Stove Patent Suit.

We take the following from the Troy Times. The well known invention of Joseph C. Henderson, of this city, for an improvement in coal toves, for which a patent was obtained in 1860, the attention of some stove manufacturers in 1540 feet per second was realized, the pressure

ings of peculiar interest. able one, in spite of the early unsuccessful efforts to introduce it. Burdett, Smith & Co., of this city, became interested in this patent some Eighth Round.—The former charge of 280 years ago, and applied it to a stove made for burning soft coal, known as the " Dubuque," and in this application the invention was very successful, demonstrating the fact that Hen- inch rose to 23.5 tons. derson's ideas were correct, and all that was required to establish the invention was a proper application of it. As soon as the "Dubuque' had made this impression upon the trade, a large number of stove manufacturers seized upon the idea of appropriating the invention, and this they did with unusual zeal, flooding the country with cheaply made and poorly mounted stoves to the great injury and detri-ment of the owners of the patent. Suits were immediately commenced against these infringers, and one of them, the Treadwell Stove Company, of Albany, came to grief yesterday, under decree entered up in the Circuit Court of the United States for the northern district of New York, Judge Johnson presiding, the court holding that the Henderson patent was good and valid, enjoining perpetually the defendants. and sending them to a master for an accounting. The suit was conducted by Esek Cowen, Esq., on the part of the complainant.

A clamp inserted in the key-hole, and held Ohjo, and Taplin, Rice & Co., of Akin, Ohio,

while the papers are ready for a like invitation to several other parties who will, in spite of admonition and request of the owners of the patent, continue to perpetrate what the courts

term piracy in this respect. The invention is conceded to be a valuable one, and there seems but little doubt among experts that it is the only means that has been devised to burn soft coal successfully in magazine stoves. All who have seen the 'operation of this invention as applied to the new stove made by Burdett, Smith & Co., called the Equinox," think that the manufacturers of it have about reached perfection in the art of burning soft coal in magazine stoves, through the advantages derived by the use of this in-

The Heavy Guns.

The military correspondent of the New York Times, writing from London, gives some very interesting particulars in regard to the new guns and the tests that have been recently made with them, which have developed some new features. It will be remembered that the 81 ton gun had a bore of 14 inches. The results then yielded were deemed highly satisfactory, and the gun was returned to the work shop for the purpose of having the bore enlarged to 15 inches. Greater power having been obtained by the increased caliber, a still further change was decided upon, which was nothing less than an innovation in the so called Woolwich system," viz., by chambering or enlarging that portion-about 40 inches-of the ore where the cartridge is placed, commonly called the powder chamber. This has now been increased to 16 inches, leaving the remainder of the bore intact. By this change it is claimed that a more perfect combustion of the powder takes place, although the cartridge has been increased from 277 pounds to 315 pounds for the battering charge; also that the volume of the gas is more often multiplied in the powder chamber. Thus it has been ascertained that in bore of 24 feet the volume of gas in a 40 inch chamber is multiplied 7.2 times, but in a 45 inch

chamber only 6.4 times. Having at last obtained guns of large bore it became necessary to resort to the American system of large grain powder, and a series of experiments have been tried covering the ground that was gone over years ago in this country to ascertain the proper size of grain for such guns. During the recent experiments eight rounds were fired with the following re-

First Round .- Charge, 266 pounds; weight of projectile, 1466 pounds; initial velocity, 1480 feet per second; mean pressure in powder chamber, 20.64 on the square inch, ascertained

by means of pressure gauges. Second Round.-The powder used was 1.7 inch cubes, the weight of charge being the same, but although the pressure of the gas per square inch showed 21 tons, being nearly threetenths more than the former round, the initial

velocity was 9 feet per second less. Third Round .- Two inch cubes were used, but the initial velocity fell to 1424 feet per second, and the pressure gauges recorded 201/4

Fourth Round .- The charge was increased to 270 pounds and cubes of 1.5 inches were used. The initial velocity now rose to 1490 feet per second, and the pressure per square inch to 21.6 tons.

Fifth Round.-Charge, 270 pounds; cubes, 1.7 inch; initial velocity obtained, 1488 feet per second, and pressure per square inch, 22-2

Sixth Round .- Charge, 270 pounds; cubes, 2 inch : initial velocity, 1446 feet per second, and the pressure gauges recorded 21.3 tons per

Seventh Round .- A further increase was now made in the charge, viz., 280 pounds, the powder used being 1.5 inch cubes. The initial velocity now rose to 1534 feet, with a pressure per square inch of 22.7 tons, the energy of the discharge being estimated at 23,900 foot tons. In the earlier experiments, when the caliber was 141/4 inches, an initial velocity of 1551 feet per second was obtained, the weight of the projectile then being 1259 pounds, and on the enlargement to 15 inches, with a charge of 300 and which was subsequently extended to the pounds, of 1.5 inch cubes, and a projectile Commissioner of Patents, is just now attracting weighing 1466 pounds, an initial velocity of different parts of the United States with feel- per square inch being 22.6 tons, and the total energy about 24,000 foot tons. For a long time all who understood the char- seen that, by the enlargement of the powder acter of the invention deemed it a very value chamber, a reduced charge has produced almost similar results without any appreciable

> pounds was continued, the cubes used being 1.7 inch. The initial velocity now fell to 1509 feet per second, and the pressure per square

> From the foregoing experiments it was established that cubes in excess of 1.5 produced a greater strain upon the gun without a corresponding gain of vis viva. The general results were deemed highly satisfactory, and further experiments will be instituted to deter further experiments will be instituted to determine the exact charges and the weight of the projectile; the latter for experiment are merely cast iron cylinders, but the service pattern will be of the usual ocival-headed description. Some idea may be formed of the immense power of this piece of ordnance by comparing it with the 20 inch Rodman, the increase of power in favor of the former being as 2 to 1 as regards energy, and its representative over the service of the comparison of the compari regards energy, and its penetrative powers im-

> mensely superior.
>
> The British government will probably be The British government will probably be mulcted in heavy damages if guns of this nature are mounted on forts adjacent to towns, for when they are discharged the atmospheric disturbance is so great as to injure buildings within a mile or two; to wit, a gasometer near the proof-butts has been so bulged in from the shock of the discharge as to render the owners apprehensive lest they should be compelled to remove the gas works to a safer position.
>
> Great preparations are being made to carry

Other suits are in progress against the Cleve-land Co-operative Stove Company, of Cleveland, Ohlo, and Taplin, Rice & Co., of Akin, Ohlo,

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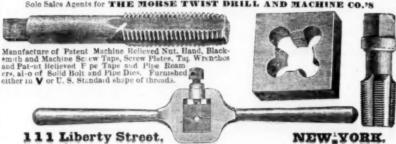
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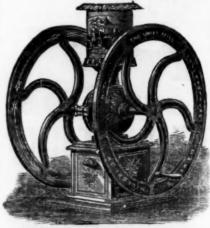
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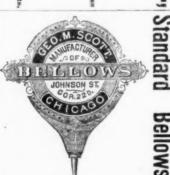
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The Sewage Systems of Large Cities.

The following brief description of the sewage systems of the principal cities of Europe and America will be of interest to our constituency of plumbers. The information was carefully collected by a commission appointed to report upon the sewage of Boston, and is contained in the public document containing his

London .- When water closets were first introduced in this city, about the beginning of the present century, they were connected with the wers. The latter were large and badly constructed; and the pollution of the soil became so great that alaw was passed forbidding their ise as a means of discharge for the water closets or privies. Cesspools were then built all over the city, and the nuisance so increased that another law was passed, in 1847, requiring that they should be abolished, and that connections should, in all cases, be made with the

The contamination of the soil from these various sources became so great that, in 1866, dur-ing the cholera epidemic, posters were placed upon all the city pumps, stating that the water was not-none of it-fit for drivking purposes. Even at the present day cases of illuess are not infrequently traced to buried and forgotten cesspools, and many polluted wells are still

In 1856 the steuch from the discharge of sew age into the Thames had become intolerable there had been two recent epidemics of choierain the city (in 1849 and 1854), and the many evils in the sewage system bad become so great that engineers and physicians had united in declaring the necessity of a change. As a consequence, the main drainage scheme was adopted, consisting of five sets of intercepting sewers, with four pumping stations.

The two outlets for the northern and southern sections of the metropolis are at Barking and at Crossness, respectively 10 and 14 miles below the city proper, and they are covered by the water at the time of discharge. At each outlet there is a reservoir capable of containing the ordinary sewage of 24 hours, if accessary. The discharge into the river from these reservoirs takes place only during the two hours succeeding high water, so that an abundance of time is given for the ebb tide to carry all the sewage to a safe distance.

In the City of London proper, where the land is quite high, the sewers are well finished, and they are ventilated by gratings placed at interwals, from one hundred feet to fifty yards apart, opening directly into the streets. Where the sewer-gases are especially foul, they pass through charcoal filters. Ventilation is also got in the different parishes by extending the soil-pipes through the roofs, by special pipes carried up above the tops of the houses, and in ome cases by connecting rain-water sponts with the sewers without traps.

The sewers of the main drainage scheme are self-flushing, and are a perfect success; and the pumps work admirably, so that places so ow that they must be protected from the Thames by embankments are thoroughly

drained.

Many of the old sewers, however, especially where the sand and dirt from the streets are discharged directly into them, require cleaning from time to time. This is done by contract, and inspections are made every three months by the sewer department to see that it is properly done. They are also flushed by gates which hold the water back until the sewers are nearly full, and then, being suddenly opened, let it go with a rush.

Since the intercepting sewers were built the evel of the ground water has been very much lowered, cellars formerly wet have become dry, and, in some few places, trees are even dying from loss of moisture in the soil.

The storm water is discharged into the Thames by overflows, some of which are so low that they are tide-locked at high water. Consequently, in case of very heavy rain at high tide, which, indeed, does not often happen, those cellars, which are placed below the grade established by the city authorities, are liable to be flooded. This difficulty, however, has been obviated for a great part of the city by means of a sewer for surface water only.

All the attempts to utilize the sewage of Lonpoint of view. There is no nuisance to the metropolis created by the discharge into the river, and the surveys of the Board of Works convince them that the harbor is not filling up nt all from sewer deposits. In fact, Sir Joseph W. Bazalgelte has given an opinion that the sewage actually helps scour the channel. All of the sewage of London goes into the Thames. except that corresponding to a population of 20,000, which is utilized, at some pecuniary loss, on an experimental sewage farm at Barking.

quite high, and there are only 5210 acres. The sewers are, generally speaking, excellent. There are nine main branches, each baving a eparate drainage area, discharging into the

In the low part of the city there are nearly 300 very great.

At the summits of the new branch-sewers, reservoirs are made of about five hundred cubic finally several hundred of them; and they will

flushing to be necessary. It is thought that some of them will never be needed

The plans of all new sewers and of all alter ations in the old ones must be submitted to and approved by the Health Committee before they can be carried out.

In the lower parts of the city nearly 8000 pipes have been carried from the sewers through the roofs of the houses, to be used exclusively for ventilation. There have been complaints of bad odors from them in only two or three instances, in which cases they have been removed Charcoal filters were used, too, at one time at the upper ends of the pipes, but were soon abandoned, as they were found to obstruct the passage of the sewer gases.

In the better parts of the city, soil pipes are carried up through the roofs, and rain water spouts are used as ventilators in many cases where their upper ends are remote from chimneys and windows. The sewer department is also constructing ventilating shafts alongside of the manholes, and opening directly into the streets. The street guilles are trapped, and are flushed in the summer time, so that they never

shall become dry. A few years ago the sewage was carried to a point north of the city, and delivered by pumps upon a farm for irrigation; but the whole pracess was found so costly that it had to be aban doned. There is very little offence from the sewer outlets, and a commission of engineers has decided that the bed of the river is not obtructed by the deposits from the sewage.

Leeds, a city of 300,000 inhabitants, has sew ers for two thirds of its population. In 1871 they were served with an injunction obliging them to cease extending their sewerage system any farther until they purified the sewage before discharging it into the river Aire. They have tried the various precipitating processes and are now using the A. B. C. in a modified form. The cost of their precipitating works has been £90,000, and their yearly expenses for working them amount to £15,000. The sewers are freely ventilated by untrapped street gullies.

Manchester, a city of 4516 acres, with a population of 356,000, has water closets for only about 50,000. For the remaining 300,000, ash closets, privies and cesspools are used, but the latter are fast disappearing. The ash closets are emptied daily by carts, at a cost four times as great as that of the water-carriage system, and in a manner which is certainly much less inoffensive. The idea of the authorities is that the river Irwell will thus be saved from pollution; but it is already so fouled by manufac-tories that it would be difficult to say whether slop-water and street-drainage do not pollute it so much that the additional discharge from the water closets would make any difference or not. The better classes—only a few of whom live in the city itself-insist upon having water closets in their own houses.

Birmingham has an admirable system of sewers, having water closets connected with about two-thirds of the houses. At the present time they depend chiefly upon one of the precipitating processes to clarify their sewage but, owing to its great expense and its failure to purify the sewage, they are trying to secure sufficient land for irrigation. The cost of the works is £13,000 a year, beside the interest on the money invested. The return from the manure sold is trifling.

Bristol .- A long intercepting sewer has been built with its outlet four miles below the city. Glasgow.-Water closets are used in the better parts of the city, and elsewhere ordinary privies or charcoal closets. The sewage of the city is discharged into the Clyde, which has been for nearly 20 years so fouled that people have avoided going up the river in steamboats during the summer. The sewers are not wel ventilated, so that the gases ascend to the highest points, where also the best houses are, and are thought to give rise to a certain number of cases of typhoid fever. Typhus is common in the lower districts, where there are no water closets. In 1868, Messrs. Bateman and Bazalgette, in their report, proposed a main drainage system to carry the sewage out to sea many miles south of the mouth of the Clyde. Sir John Hankshaw has recently been asked to make a report on the ques-tion, and it is not yet decided what is to be

Edinburgh has not yet completed sewers for have proved failures from a pecuniary templating doing so. The sewage of the northern part of the city, which formerly created a great nuisance by its discharge into the River Leith, has been intercepted by a main sewer and carried out into deep water.

Much of the sewage of the other parts of the city is flooded over four prigation farms, which are profitable, but the sources of considerable complaint. It is proposed to build another long intercepting sewer on the southern side of the The ventilation of the sewers is deficient, and

as in Glasgow, typhoid fever is observed in the Liverpool.—The drainage of this city is a com-paratively simple matter. Most of the land is the tops of the sewers. Typhus is not uncommon in the "Cowgate" and "Canongate." where the poorest classes live.

Thr. e inspectors are kept constantly em ployed looking after house drains, and compel Mersey at deep water—in one case by a siphor ing house-owners to repair breaks and imper—and at points 8 feet below high water mark.*

Dublin has, in the main, good sewers, but acres occupied chiefly by warehouses and their discharge into the river Liffey is a source drained by tide locked sewers; and, in case of of so great annoyance that many business men heavy rain at high water, the damage done in have been obliged to remove their offices from the cellars of this district has sometimes been that part of the city. The system of interceping sewers with two siphons accross the Liffey. proposed by Mesers. Dazalgette and Carrick in their report, it is generally supposed will be feet capacity, to be used for flushing purposes, adopted, at a cost of £500,000. The In many cases, too, similar reservoirs are mak- sewage is to be discharged at deep water, seveing for the old sewers, so that there will be ral miles from the city, and at a point where it finally several hundred of them; and they will can be utilized by irrigation, if it shall be used as often as frequent inspection shows

"The tide, as in London, rises and fulls about 90 evil which they mean to correct.

(To be continued)

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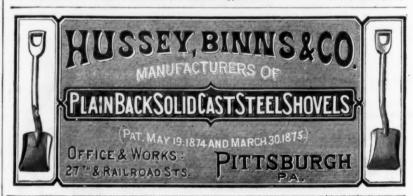
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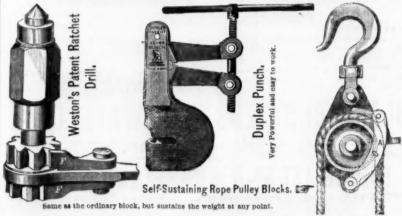
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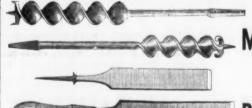
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Grindstones.

BY J. E. MITCHELL, PHILADELPHIA.

modern developments and enlarged capabilities, there has been applied no mechanism nor process yet able to supersede the grindstone in its peculiar office. It is the one thing in mechanic the mainland down to low water mark in the arts that improvement has not added to, or invention displaced; while the pruning book and plow are of equal antiquity, the spirit of improvement has touched both but left the grindstone unchanged. Its utility in the early sges any by its perfection of other means for like results. It has been found in use among uncivilized people, and yet has its place with nations most advanced. Writers of fiction knew t would not conflict with the appearance of truth to ascribe it a place among barbarians. It is among the few implements of handicraft mentioned in Scripture, though there only named for milling purposes; it is the same in form and in universal use—a round revolving In a scriptural research for the articles of handicraft mentioned then, we can look through the "eye of a needle" and find the grindstone beyond, its origin lost in the darkness of antiquity. It is not meant to confound he milistone of antiquity with the grindstone of to day, which the Encyclopedia mentions at "a flattish circular stone of various diameters, mployed in the cutting and sharpening of edged tools, precious stones, &c., and the grinding of steel, glass, pottery and the like. They are made of saudstone, or sandstone grit. The grindstone now has scarcely a wider capa bility or greater usefulness that when we first hear of it. Although limited as its qualifications may be, it serves its purpose as nothing else can. Improvement has furnished us wheel of composition which only, to some extent, serve some of its purposes, but the grindston still remains unsupplanted. It is a tool of the tmost nicety in proper hands and properly un derstood, and is capable of performing with speed and precision its limited agency, beyond the powers of any modern tool. It is perhaps found best handled in its purpose of grinding dies for cut nails, where its proper use consti tutes an occupation not to be attained very per fectly by a short apprenticeship with it. That known as the "bead stone," used by makers of cut nails, is a tool of the utmost perfection of workmanship, not to be meddled with by the inexperienced, however lightly, without the result being noticed by the eye of the experienced The milling machine, the planer, the file, the lathe and emery wheel, do much of the work of the grindstone, but it still performs to perfection its needful though limited purposes The importance and nicety of it, as a means to a purpose, is only known by those who know how to prepare and keep it in order.

Its utility or importance could not be guessed at, were one to look at a crooked and badly kept grindstone; but in the hands of those who know its merit, with its even surface running as true as any turned wheel, it will perform work with a rapidity and precision attainable by no other means. In the hands of those who are learned in its use and keeping, it is capable of adaptation to intricate and fine work, but with those who do not understand it, it is rude and the very opposite of what the educated craftsman would select for any purpose of fine employment.

An heirloom of antiquity, but used amon us as we received it, and without any attach ment or improvement; capable of its complete functions only when well kept and well applied,

quarries are worked by hand, and all the grindstones are made with mallet and chisel, grindstones are made with mallet and chisel, and have been imported into this country for over 100 years. The grindstones from the provinces of Nova Scotia and New Brunswick are, also, the overlying sandstone formation of the coal district bordering on the Bay of Fundy and extending across the province to the Gult of St. Lawrence. These immenss deposits contain a great variety of grits, known as Nova Scotia griddstone. These immenss deposits contain a great variety of grits, known as Nova Scotia griddstone. These immenss deposits contain a great variety of grits, known as Nova Scotia griddstones. These immenss deposits contain a great variety of grits, known as Nova Scotia griddstones. These griddstones are not in use, as this will to stand in water when not in use, as this will cause a soft place. 2d. Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use, as this will cause a soft place. 2d. Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use. 3d. Don't allow the stone to get out of order, but keep it perfectly round by the use of a piece of gas pipe or a hacker, or use a pair of the double hung stones, which keep each other in order. 4th. Clean off all greasy tools before sharpening, as grease or oil destroys the grit. saw sets (Bartz Patent). Saw test stand a great variety of grits, known as Nova kent), Saw Sets (Improved Sensit), so and Tea). Weathers (Tin and Ir.n.) as a specialty, and IMPLEMENT of grindstones. These quarries are genering, as greas or oil destroys the grit. Sth. Observe—When you get a stone that ally worked by the French people, known as pour grit to the dealer to select by; a half ounce try, "Acadian," and are descendants of the great try, "Acadia," and are descendants of the Huguenots, who were driven out of France by (To be continued.)

(To be continued.)

religious persecution. Thay are a very industrious and simple minded people, and the females retain to this day the style of drest rought over from France by their ancestors In the whole range of mechanics, with all The tides of the Bay of Fundy rise and fall from 60 to 70 feet every twelve hours, and these eople avail themselves of this power to work the quarries, which extend from a high bluff or bay. At low water a huge mass of stone

loosened from its bed and a heave

chain is passed under it and over a large boat which is placed alongside. As the tide rises the stone attached to the bottom of the boat was great, and science has not lessened its value | floated into a sand cove at high water, and made into a grindstone after the tide recedes. This done with a mallet and chisel, the rough parts being first chopped off with a heavy axe. Machinery has been recently introduced, and the small grindstones are now turned in a lathe by steam-power. The sandsione deposits of this country which are made into grindstones are found along the shores of Lake Erie, and extending for a considerable distance east and west of Cleveland, and inland as far as Marietta. on the Ohio. They are also found on the shores of Lake Huron, above Detroit. These deposits are of a different character from the foreign stone, and do not seem to be the overlying strata of coal formations, but appear to be a later formation as the quarries look as though this part of Ohio had once been the bottom of the lake, the sand of which had become solid, and been upheaved by some convulsion of nature. Nearly all the Ohio grindstones are made by machinery driven by steam-power.

The blocks of stone being loosened from the quarry bed are roughly hewn out with a square ole in the center, they are then placed on a heavy square iron shaft furnished with a nine inch collar, against which the stone is securely fastened by means of another collar keved against the stone. The shaft and stone being driven by steam-power, two men on opposite sides of the stone turn it off perfectly true by means of soft iron bars six feet long, two inches by one-half inch thick, which are drawn out to a thin point which is curved upward. This was formerly a very unhealthy operation, owing to the dust being inhaled by the workmen, but this difficulty is now obviated by means of blowers which drive it away.

USES OF THE GRINDSTONE.

There are specialties in mechanic arts which are the results of many years of practice, and in nothing more than in the varied and important uses to which grindstones are applied. Formerly their operations were confined to the sharpening of tools only, but this is now only a small part of the uses to which they are put, as it has been found by experience that almost small part of the uses to which they are put, as it has been found by experience that almost every kind of steel, iron and brass work used in finished machines can be ground better and cheaper than by filing. Almost every part of a locomotive engine is now finished on the grindstone, which leaves the metal in the best possible condition to receive the polish or paint in finishing. The Baldwin Works, Philadelphis, keep six grindstones of 4000 pounds each running constantly on locomotive work alone, not only all the rough castings being ground, but 41 working parts of the engine are finished in

ning constantly on locomotive work alone, not only all the rough castings being ground, but 41 working parts of the engine are finished in this way, beside grinding off the faces of their anvils, some of them weighing 700 pounds. The master machinists of nearly all the railway repeir shops find it to their interest to keep at least one grindstone in use for this purpose. Grindstones are also used for finishing polleys of all sizes. The pulley is caused to revolve against the stone, which runs rapidly in an opposite direction; this grinds down the face of the pulley very fast, and at less cost than turning it off in a lathe, beside leaving it perfectly true. It requires, however, a very peculiar grindstone for this purpose, the grit of which should be very sharp and firm, so as not to crush down with the necessary pressure, and yet not so hard as to glaze in using. A peculiar kind of Newcastle grindstone has been found to meet these requirements, and should be used with water to prevent heating.

MACHINISTS' GRINDSTONES.

MACHINISTS' GRINDSTONES

ment or improvement; capable of its complete functions only when well kept and well applied, and this is only found with those whose craft education is solely to handle it. It alone can cut and shape expeditiously that which is prepared to cut and shape all other hard materials—cast steel hardened. It is still employed to give the finest edge, the most even surface, the brightest polish, and is the quickest to accomplish it. The emery wheel does but a few of its purposes, and nothing that we have could supply its place. The file has its own peculiar uses, but in contact with the grindstone, its thcusends small cutting edges would be reduced to polished plainness. It is found a necessary implement on the farm, and is still required where the finest of instruments are made, or the hardest of metals are worked. It has come to us as we have it, and in all likelihood will pass on down to other ages the same—a simple circular stone, swiftly revolving on an axic. All nations use it; and it is perhaps, with all the one piece of mechanism that bears the same form, and is the same in principle. More or less directly it takes part in the greatest modern material enterprises; it has, no doubt, assisted to fashion the implements of many of the lost arts, and is still needed in many of the requirements of arts of the present day.

As ages revolve and invention gives to the world new devices, may it be found more the agent in forming the plowshare and pruning hook, than in sharpening the sword.

WHERE GRINDSTONES COME FROM, AND HOW THEY ARE MADE.

The sandstone formation overlying the coal both and the required to grind to perfectly in the stone by function of the stone by running it in work ment of the grindstones are made with mailet and chies!

There is probably no implement in the machine shop of factory which pays better for the chine shop of a feature the supply tool and all enterprises to account the time the coals of the proper selection of the grift for the purposes intended the purposes intended the use of the grift

1st. Don't waste the stone by running it in water, nor allow it to stand in water when not



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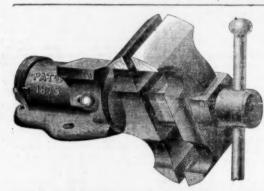
The most economical and durable Pipe manu actured for Water Works, Oil Lines or Gas Maina

General Riveted Work

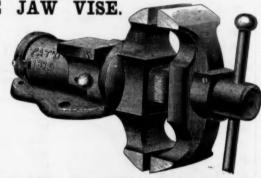
solicited from Civil Engineers and Contractors.

mpanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

Bridgeport,



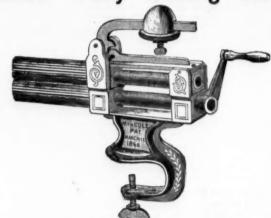
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Each Lock is furnished with TWO OR MORE SMALL, FLAT, STERLING METAL KEYS.

The Locks are nited to the keys and not the keys to the Locks, and as no impression of the Lock can be taken, no false (or c uniterfeit) keys can be made without the original Key to work from. The variation of one-fittieth of an inch in any of the tumblers of the Lock from the position in which they are fitted, prevents the working of the Lock.

Each Lock contains forty tumblers, each having five false notches, which bust upon the Key at two different points and are worked without the sid of any springs.

All working parts of the Lock are made of fine brass, securely incased, and all bolts in the Locks are moved by an Eccentric, hence there are no springs to break or wear out. When extra Keys are desired, one of the original Keys must be returned, as we do not duplicate by number.



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Reduced view of Perspective Plate 28

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WM. M. WOOLLETT. Fellow of the Am. Institute of Architects. LIST OF ILIUSTRATIONS.

No. VILLAS.

1 Basement, 1st and 2d story plans of Frame Villa. Scale indicated on plate.

2 Perspective view.

3 Perspective view. Frame Villa House. Plans similer to Design Fo. 1.

1-t and 2d story plans of a Brick Villa. Scale indicated on plate.

5 Front elevation of Villa. Scale indicated on plate.

Perspective view.

plate.
Perspective view.
Ground and 2d floor plans of Brick Villa.
Seate indicated on plate
Perspective view.
Ist and 2d floor plans of a Frame Villa Scale
indicated on plate.
From elevation.
Ist and 2d story plans of a Frame Villa.
Perspective view.

6 12 Perspective view, land of a Frame Vila
7 13 1st and 2d story plans of a Frame Vila
7 14 Front elevation.
8 15 Perspective view of a Villa. Plans similar to Design 7.
9 16 1st and 2d story plans of Brick Villa. Scale indicated on plate.

midicated ou plate.

9 17 Perspective view.

10 18 1st and 2d story plans of a Brick Villa. Scale indicated on plate.

10 19 Perspective view.

11 20 Perspective view of Brick Villa. Plans similar to Design 10.

12 21 1st and 2d story plans of Frame Villa. Scale indicated on plave.

12 22 Perspective view.

COTTAGES.

23 1st and 2d story plans of a Frame Cottag
Scale indicated on plate.

24 Perspective view.
25 Perspective view of a Frame cottage. Plans
same as Design 13.

36 1st and 2d story plans of a Frame Cottage
Scale indicated on plate.

37 Front elevation.

3 28 Perspective view.

49 1st and 2d story plans of a Frame Cottage.
Scale indicated on plate.

49 1st and 2d story plans of a Frame Cottage.
Scale indicated on plate.

4 30 Perspective view.

Scale indicated on plate.

Perspective view.

Ist and 2d story plans of a Brick Cottage
Scale indicated on plate.

Perspective view.

Ist and 3d story plans of a Brick Cottage.

Scale indicated on plate,

Perspective view.

Scale indicates.

Perspective view.

1st and 2d story plans of a Frame Cottage Scale indicated on plate.

Scale indicated on plate,
7 36 Perspective view,
8 37 Perspective view of Cottage. Plans similar
to Design 7
9 38 Perspective view of Cottage. Plans similar
to Design 7,
10 39 1st and 2d story plans of a Brick and Frame
Cottage. Scale indicated on plate.
10 40 Perspective view.

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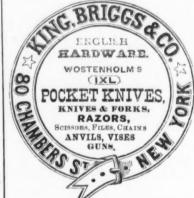
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BUSINESS ITEMS.

NEW YORK. The merchant and rail mills at Rome are run

ning steadily. PENNSYLVANIA

The Little Schuylkill Rolling Mill, above Port Clinton, made last week 77,592 pounds or 34 tons 1432 pounds 7-16 inch square iron. The smallest amount made in any one day was on Saturday-4 tons 944 pounds. On Thursday they made 16,400 pounds, or 7 tons 720 pounds. While this was being done by the day shift, the night shift made during the week 27 tons 92 bounds billets. Considering the time of the vear and the size of the iron, this is a very heavy yield from one heating furnace.

The new tube works at Fern Dale bave been named the "Standard Tube Works," and are expected to be ready for turning out pipes in ptember or October next.

The Emaus Furnace is advertised to be sold on July 18th, by order of the Fidelity Trust and Safe Deposit Company, of Philadelphia.

The Allentown Herald is authority for saying that the Friedensville zinc mines are to be closed on account of the great expense of mining the ore, when it can be purchased from other parties for less money. Thus the largest pumping engine in the United States will not e employed.

The Baldwin Locomotive Works, at Philadel phia, are now delivering 17 engines to the Dela vare, Lackawanna and Western Railrond. Two of these are 18 by 24 in. cylinder consolidation engines, and 10 are Mogul pattern, with 18 by 24 in. cylinders. The consolidation engines are substantially like the one built for the Lehigh Valley Road, and now on exhibition at the Cen-An order for 10 wheel engines for the Lehigh Valley Railroad is also in progress .-Lehigh Register

Messrs. Noblit & Bro., Tioga Rolling Mills, Germantown, who have heretofore done no puddling, have just put in a furnace, and will begin working pig immediately.

PITTSBURGH AND VICINITY. The glass manufacturers have carried out

their intention, and every furnace but one is But little work, comparatively, will be done at the rolling mills in this neighborhood for

the next four weeks. Some will be stopped for annual repairs, and others to take stock Some of the largest mills have as yet refused to sign the boilers' scale, and some that have done so are working only half time.

The Pittsburgh Exposition will open the 16th f August.

The Rochester Tumbler Works have veekly capacity of 200,000 tumblers. They use natural gas in their manufacture, and ship their wares largely to the Gulf and South Amer ican States.

Bakewell, Page & Co. have been manufactur ng glassware for 68 years. Fifty years ago they made Lafayette a present, and got the following reply:

PITTSBURGH, May 31, 1824.

GENTLEMEN—The patriotic gratification I have felt at the sight of your beautiful manufacture is still embanced by the friendly reception I have met from you, and by the most acceptable present you were pleased to offer me. Accept my affectionate thanks, good wishes and regards.

Mrs. (ci) Belevall Poer 5. Parketter. Mrs. (sic) Bakewell, Page & Bakewell, Pitts burgh.

WEST VIRGINIA.

The South Wheeling Glass Works have just completed an order for a set of ware left by Miss Maggie Mitchell at her last visit to that

The experiment of using charcoal furnaces for the manufacture of iron with stone-coal, without any change of machinery, hearth and inwall, has so far not been very successful. While some furnaces have, for a little time, done well, others have chilled and scaffolded, and been obliged to blow out.

The Belfont Furnace has stopped until there s a sufficient rise in the river to get a stock of

The Alice Furnace seems to be doing better since it abandoned the self-coking system. They are shipping their iron as fast as made.

The Canton Wrought Iron Bridge Company have just been awarded contracts for seven of their bridges by the Commissioners of Alleghey county. Pittsburgh. The bridges from 40 to 50 feet span.

The Enterprise Machine Co., Cleveland, are running 12 hours a day on machinists' tools and turning car axies for the C., C., C. & I. Railroad.

Cleveland is erecting a liberty pole of Besse

The managers of the Russia Mill, at Niles, owing to an increased demand for their productions, contemplate putting on another set of workmen in their sheet mills, thus running three turus, each turn working eight hours. They have been erecting several nail machines for some time past, two of which were put in operation Tuesday. The rest will be started as soon as they are ready.

Both of Cartwright, McCurdy & Co.'s mills,

native ore and coke, making the best of iron. The Iron and Steel Company have one ore kiln in West Ironton, undergoing the process of roasting. Furnacemen in this region are havng trouble getting Missouri ore. The Ætna has had an order in for several months and annot have it filled. The Sheridan Mining Company are now making coke. pecimens brought to town show that it is of xcellent quality.

The Girard Furnace is in blast, the rolling nill running full capacity, and the stove works re active.

The Cleveland Not and Bolt Works are turn ng out some 50,000 nuts and bolts per day.

Mr. Thomas I. Murdock has been elected president of the Iron and Steel Company. ronton, in the place of Mr. Robert Scott, resigned.

KENTUCKY

The Louisville Plate Glass Works will be eady to go in full blast in about 10 days or two weeks, with a capacity three times as great as heretofore. Seven large steam engines and other ponderous accessories have been added. The director general of the oldest and largest plate glass works in France has recently paid the Louisville works a visit, and pronounces them first-class, and far beyond his expectation. ILLINOIS.

We take the following from the Rock Island Daily Union: The Union Malleable Iron Company intends to commence in a week or so to econstruct its present building and put up many valuable additions suited to its trade. The foundry will be placed on the north end of the lot close by the river. The front of the entire shop will be built two stories bigh, with galvanized iron cornice and window caps, extending back 50 feet. Beyond that will be the one story workshops-finishing shop and foundry. The buildings when complete will consist of an office 20x20, with a private office 8x14, a pattern vault 12x40; store room 40x40; finishing shop 50x50; annealing room 50x100; pattern room 40x40; foundry 117x60. An extra set of new annealing ovens will be put in of the latest designs. The old ones will also be kept in order and ready for use in case of any mishap occurring to the new ov ns, or both can be used in case of a rush of orders. This company is meeting with great success. C. S. Ellis is president; C. W. Heald, vice-president; and H. O. Sleight, secretary and treasurer.

MICHIGAN. The Herald, Negaunee, says: The Iron Cliffs Company is running both stacks of the Pioneer Furnace steadily, having plenty of stock on haud, and are doing excellent work. Nearly all the iron turned out is No. 1, of the best quality, and we presume neither stack will

be blown out during the summer. The Rolling Mill mine is taking out and ship ping on an average 400 tons of ore per day. One bundred men are employed in these mines. One hundred additional men have been set to work in the Republic Mine making the full force fully three hundred and fifty. Large quan-tities of ore are being shipped from these

mines.

The New Burt Mine is being worked with 50 men, and from 60 to 100 tons of orc is being raised daily.

The May product of the Calumet and Heela mtues was 1230 tons, 710 lbs. The Osceola produced 100 tons.

The Munising Furnace, Marquette, is receiving a new hearth and will be blown in at an early day—about the 15th inst.

The Marquette Mining Journal of the 17th ult. says: The Carp Furnace was relit this week, and commenced making iron on Wednesday, the 14th ult. working nicely until about 4 o'clock, p. m. the following day, when the arch of the hot blast fell in, which necessitated a stoppage of about thirty-six hours.

The Bancroit Furnace has blown out, having used up all its stock.

TENNESSEE.

The experiment of making steel at Kingston The experiment of making steel at Kingston has been thus far entirely successful. It is made from pig iron direct into puddled steel, and then refined in crucibles, under a patent granted Mr. John Leighton by the United States government. The result thus far has been a production that is spoken of in the highest terms by the manufacturers of cutlery. The capacity of the works is now but about 1000 pounds per day, but the whole thing is in the hands of some of the wealthiest men of East Tennessee, who are simply biding their time to develop it to a first-class manufacturing establishment.

who are simply broing their time to devele; to a first-class manufacturing establishment. Owing to the disabling of the engine, ope tions are temporarily suspended at the Ro-iron Company's rail mill. Work will be sumed as soon as the engine is repaired.

Flexible Shaft for Transmitting Power.

An important and interesting mechanica noveity in Machinery Hall is an exhibit of Stow's patent flexible shaft and tools, located in section D, column 68. The leading idea of this important invention was patented in August, 1872, since which time it has been extensively and successfully applied to dental purposes, as well as to wood carving, to drilling rocks, cleaning castings, cleaning boilers, etc. It is applicable to many purposes, one of the most important being the removal of flues from locomotive boilers, and the performance of other classes of work in railway repair shops. The exhibitors, Stow & Burnham, have opened an office and factory at No. 500 North Fifteenth street, Philadelphia, where they now manufacture cables or flexible shafts for the communication of power, and appropriate tools for a variety of work. The flexible shaft is composed of from or steel wire closely coiled back and forth until the desired diameter is attained; it is then inclosed in a case also composed of a coil of wire and covered with leather. By its construct Both of Cartwright, McCurdy & Co.'s mills, at Youngstown, are running double turn.

Brown, Bonnell & Co., Youngstown, have signed the sliding scale, and their puddlers have gone to work double turn, three heats to the turn.

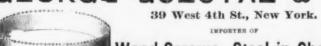
All the mills at Youngstown have signed the sliding scale, and the five mills are now in operation.

All the mills at Youngstown have signed the sliding scale, and the five mills are now in operation.

Miller, Jamieson & Co. are at present building an iron bridge for Cuyahoga county, a Pratt truss bridge for Knox county, and received orders last week for ten boilers; one 54 inch shell, one 64 inch shell, four 10 horse and two 25 portables and two 20 horse-power boilers.

The following Hanging Rock furnace news is gathered from the Ironton Journal: The Lawrence mill went on with a full force Monday morning. Alice is running on

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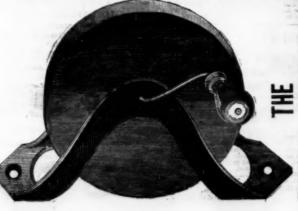
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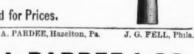
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New York, Thursday, July 6 1876.

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Shaft for Transmitting Power.

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Are We Suffering from Overproduction?

It is of the utmost importance in the di cussion of a subject, that we should avoid calling things by wrong names. Such a misuse of terms confuses people's ideas. and usually sets them thinking in wrong directions, only to arrive at last at mistaken conclusions. We find an instance of this in the constant and very general misuse of the word "overproduction." It ance is the end and aim of all human is an easy word to pronounce, it sounds well and is very comprehensive-reasons, probably, why it is so generally employed. If the question is asked, "Why are our power of all classes of the people to gratify 'productive industries so unprofitable, and "our distributive industries so sluggish ?" the easy and natural answer seems to be overproduction." We hear on all at which overproduction will become possides that the enormous expansion of sible. But we have not reached it yet, our productive industries has given nor should we in centuries if a more rapid us a capacity for production in excess of our consumptive requirements. People tell us that by the aid of steampower and machinery we are able to make so much more than the world needs, that we cannot expect prosperity again until think, is easily found. Capital, always next year, or force their product on the an increase of population shall have an increased consumptive capacity. In a bor employment, We will even go so far possibility of profit. So long as the manword, we are told by everybody who has as to say that, if every manufacturing and ufacturers continue the policy of geiting out thus disposed of for a time; but under ex- cost of manufacture, it shows that someany opinions to ventilate that the cause of other large industry could be suddenly as many new stoves, and making as many isting conditions the less we trust in an ar- thing is wrong, and it behoves a railroad our present trouble is "overproduction." quickened into the greatest activity which changes in old ones, as possible, so long tificial demand the better we are off. We to inquire into the matter thoroughly be-

for the assumption that our accumulation and production of useful commodities exceeds our requirements? We do not think there is. Trouble, so far as useful commodities of all kinds are concerned, is not with production but with consumption. Our manufacturing capacity has increased very little, if any, since 1872. Certainly our production is less now than in that year. and yet no one then complained of overproduction. All classes of the people gloried in the development of our manufacturing industries, and newspaper writers found in the extent and variety of our production a congenial theme upon which to dilate when topics were scarce. Suddenly, from causes which need not be specified, we witnessed a great shrinkage in the consumptive requirements of the country. Manufactures began to accumulate, manufacturers were forced to reduce production, and, in some instances, to stop, and the evidences of a partial paralysis were seen in all departments of industry. This was not due to an increased production, nor to a large accumulation of goods on the market. On the contrary, it grew more and more severe as production shrunk and accumulations of stocks were worked down. Now, it is evident that the country consumed more of useful commodities in 1872 than it needed, or that the people are now consuming less than they need. Which, in the judgment of the intelligent reader, is the more probable?

Presented in this shape, we fail to see how any one can escape the conclusion that the trouble is, as we have already said, not with production but with consumption. When everything was prosperous and business was good, no one ate more than he wanted, no one wore more cotton or woolen cloth, more hats or boots than his convenience and comfort demanded, and no one bought anything useful merely for the sake of buying it. There were necessities, wants or desires to account for the most liberal consumntion we have ever witnessed. We are justified, then, in concluding that the only reason we now have a supply of useful commodities beyond the present requirements of distributive trade, is that the people of the country are not now providing for their necessities, supplying their wants or gratifying their desires as fully as in 1872. Evidently, this economy of consumption is not voluntary. Circumstances have compelled it, and, in many instances, extreme poverty has enforced it. The working classes are economizing

to a greater extent than they have found necessary at any time since the bad years which followed the panic of 1857. The middle classes are economizing because salaries have been cut down, incomes have shrunk, and business of all kinds is less profitable than formerly; the so-called wealthy classes are economizing because real estate has fallen, rents have declined, and taxes and assessments !eave of the income from real estate a very narrow margin of interest. In New York there are thousands scantily fed from the hand of charity. Throughout the country there are millions who are planning and contriving to make one dollar do what, in more prosperous times, would scarce be expected of ten. A gentleman now in this city as a delegate to the National Board of Trade from a district containing a very large working population, tells us that thousands of families in the State from which he comes are living on potatoes and salt, and a scauty supply of these. And so we might go on until we had filled the page. Does any one suppose that the people of the country would not consume a great deal more than they do if they had anything to give in exchange for the useful commodities they want that manufacturers and merchants were willing to take? If so, let him, if he be a merchant, offer to exchange food and clothing for days' work, and he will see his mistake.

It requires little argument to convince the intelligent man that universal abundeffort. The condition of greatest earthly good of which the human mind can conceive, is one in which it were within the all right and reasonable desires. When that condition is reached throughout the world, we shall have attained the point increase of useful production than the world has witnessed in this or any previous likely to sell between this and spring.

we are now suffering? The answer, we lives of carrying a large stock over into selfish and always timid, is not giving la- market at prices so low as to preclude all years speculation came to the relief of an be possible to make good wheels cheaply.

appliances of civilized labor, overproduction, we should find room in proportion of the new styles sold. our markets for a vast aggregate value of imported products. In our judgment, the only remedy for the condition of affairs of which we hear so much complaint, lies in tal invested in this business would not largely. the success of well directed efforts to give employment to the idle labor of the country. This may seem an impracticable remedy, and so it is, so far as the individual reader is concerned, but if every man in his sphere, whether it be large or small, would do all in his power to set in motion the wheels of industry by giving employment to all the labor he could make use of, himself, a new life would thrill through the sluggish pulses of trade, the clouds hear from others on this and kindred methods of purchase, and the contracts vould disappear, and in three months the hard times following the panic of 1873," would be remembered only as one remembers in the morning a troubled dream of the night.

The Price of Stoves.

A correspondent in the stove business ends us the following sensible communication, which, we hope, will receive the attention of all who are interested in the

attention of all who are interested in the subject of which it treats:

To the Editor of The Iron Age: I always read with interest the articles in your valuable paper on the subject of prices of stoves, and the manner of doing business by the dealer, and also the deliverances and addresses of the National Association of Stove Manufacturers at their meetings from time to time. There is a manifest dissatisfaction on the part of the dealer about the prices at which manufacturers sell, and their consequent profits on stoves. There is also an evident uneasiness on the part of the manufacturers, as they express themselves at their semi-annual meetings, about their balance sheets for the past year. Fraternal feelings expressed at business meetings, and a scale of prices recommended by the members of the Association as the natural outgrowth of the kindly feelings, is one thing; but when the members disband, and go out into the field of operation to make sales of their stoves, regardles of such expressions and recommendations, it is quite another thing in the practical working. And hence the legitimate complant of dealers about manufacturers, and the small profits as shown by the balance sheets of manufacturers themselves.

It would seem to the uninitiated that manufacturers all know about what is meant by first-class, second-class and common stoves, and a half cents per pound, that that would be the approximate price of

class, second-class and common stoves, and when the price is recommended to be, for common stoves, six and a half cents per pound, that that would be the approximate price of that class of stoves; but when the salesman strikes out on the road and makes sales at prices ranging from 4e. to 614c, per pound for common stoves, with a standing banter along the route that he can and will sell a little lower than any other house, the natural result is that the next salesman will shade him, if the dealer is shrewd enough to read his man. Then, as a consequence, dealer A buys a little lower than dealer B in the same or contiguous towns, owing to the astuteness of the buyer and the strength of the banter laid out by competitive salesmen. Now, would it not be better for the manufacturers to practically live up to the scale of prices as recommended by the Association, thereby making a better profit, and giving, at the same time, greater satisfaction to the dealer, because then he knows he is buying his stoves as cheaply as his neighbor.

Another source of trouble between manufacturers always have some obsolete patterns that they are offering to close out to dealers at greatly re-

always have some obsolete patterns that they are offering to close out to dealers at greatly rereduced rates, and every year they have about the same number of them. Others, in order to the same number of them. Others, in order to remove stoves from a certain warehouse, offer great inducements in low prices until the stock in that warehouse is cleared; but it so happens that the stock of stoves in that warehouse is like the widow's cruse of oil—the more taken out the more left; hence, keeping up a con-tinual friction between manufacturers, and a corresponding dissatisfaction between manu-facturers and dealers.

If the theory be correct that there is over-

If the theory be correct that there is over-production in stoves, does it not seem like folly

production in stoves, does it not seem like folly to continue to make as many stoves as before, and sell them at a lower price, which many manufacturers are doing? The better way to unload would be to maintain a fair price, and not make as many stoves; because when stoves are reduced in price it is hard work to get the price up again to ite former standing. It is just as hard work for the dealer to raise the price after having cut under, at it is for the manufacturer to put un the price at it is for the manufacturer to put un the price. as it is for the manufacturer to put up the price after having reduced it, from whatever cause. If the manufacturers would maintain a fair and uniform price, it would be all the better for the dealer, for the inducements would not be so went to the dealer to only prices. If stoyes great to the dealer to cut on prices. If stoves were sold at the scale of prices recommended by the Manufacturers' Association, there would be less complaint of small profits, as shown by balance sheets, and much greater barmony be-tween dealers therefore and dealers, and also be-tween dealers therefore. en dealers themselves.

How would it do to try the experiment for the coming fall trade? Let us bear from others dealers and manufacturers. Yours truly, H.

This communication calls for no comment from us. We have no doubt that the complaints of our correspondent are well founded, and that the remedy he suggests for the evils from which the trade is suffering is perfectly practicable. The only course open to the prudent founder is to make no more stoves than he has reasonsonable assurance of being able to sell. Some of the largest and best-managed foundries of which we know, are running only about two-thirds of their capacity, and still are making all the stoves they are Those who adopt a different policy will, we What, then, is the trouble from which fear, have to chose between the alterna-Now, is there any foundation in fact steam-power, machinery and all the will they be compelled to sacrifice their have learned some severe lessons since 1878, fore purchasing.

rendered possible, we should as suddenly very apt to be driven by traveling sales-

All things considered, we regard the situation in the stove trade as very critical. Four-fifths of all that represents the capiprobably be worth five cents on the dollar at forced sale, and never will be. The business is passing through a transition period in which great changes are inevitable, and the policy of the manufacturer is to be prudent and cautious in all things. He had better make nothing which he consult his best interests by showing very ven though without immediate profit to little of the kind of "enterprise" which our correspondent describes. We hope to subjects. The dealers, with their suggestions and these demands, have led the manufacturers a wild race for some years to a safe and solid basis, favorable alike to those who make and those who sell stoves. they will thereby undo something of the mischief they have done in encouraging so wide a departure from a safe basis.

In our judgment, the trade is suffering from an overdose of "frills," and when guaranteed for 60,000 miles average serthe dealers are tired of these there will be vice. Taking into account the fact that some chance of a return to plain goods and standard styles. There will always be a limited demand for the very best and in., and perhaps, 4 ft. 10 in. gauges, with most elegant goods which can be made; but no one is benefited when the manufacturer bankrupts himself trying to make second-class stoves look like first-class, and spite of such a contract as this, however, then selling them at third-class prices.

Tin Plates.

declined to an average of 25 per cent. below their value in July, 1874, it was supposed that they had reached a point from which a further decline was impossible. This supposition was reasonable enough, but expectations of a recovery were disappointed, and the decline continued until prices averaged about 29 per cent. below it a safe one. The founders are selling those of two years ago, as will be seen from the following comparison:

Ordinary brands. Gold per box. Charcoal Bright. \$6.75 to \$7.00 to \$6.50 Coke Tin. ... 6.00 Ternes. 6.50 ... 5.50 1874, July 1. Gold per box. \$10 25 to \$10 50 9 00 to 9 50 8 00 to 8 25 7 00 to 7 75

\$6.20 \$8.71 Up to the beginning of the current year, shipments of tin plates to the United States were steadily on the increase, as will appear from the following comparative statistics of importations:

1,531,356 1,511,632 1,585,994 1,673,435

has been a decrease of about 18 per cent., to put under cars poor wheels which must as compared with last year. The receipts be soon taken out, even though they cost at New York since January 1st have been nothing. The cost of replacing and the 413,375 boxes, against 495,767 from Janudelay of the rolling stock make such wheels ary 1st to July 24th, 1875. The exports of costly. Secondly, in the cases which have tin plates from Great Britain to all coun- come to our notice, the firms have little or tries in 1875 was 138,563 tons, against 122,- no knowledge of wheel making, and we 960 tons in 1874, and 120,638 tons in 1873. fear their products are not to be trusted. For the first quarter of 1876 the British Wheels do not commonly give out suddenexports to all countries were 30,960 tons, ly, yet, under such a system of manufacagainst 37,242 and 34,872 tons for the cor-ture, we have no means of assuring ourresponding periods of 1875 and 1874 re- selves that they will not do so. Thirdly, spectively. These large shipments have the guarantee is by no means certain to overstocked the dull markets of this and give good wheels. If they are sold for less other consuming countries, thus bringing than cost, it will not trouble the manufacabout the decline in prices which has turers much to supply new wheels in the forced a curtailment of production in Great place of those that fail. The money comes Britain. The evil has thus worked out its from those who float the concern, and not own cure, and tin plates are now in a fair from those who are immediately connected way to recover-at least to an extent which with the business. They are really spendwill make production moderately profit- ing capital and making no money. Reable. As compared with the average of sponsible men cannot compete with such the past few years, however, they are concerns, and it is merely a question of likely to be cheap for some time to come. time for the roads to be swindled. Iron, block tin, coal and labor have all de- know that some of these firms do, at times, clined considerably during the past three buy the very best charcoal wheel irons,

the causes above noted have been operat- tinuance of such firms in business would, ing to effect important changes in the tin in the course of a few years, put car wheel plate market. The effect of a diminished manufacture back to where it was in 1864, production and a diminished export will when, upon a single road which we could probably be felt first in a sudden scarcity name, 50 wheels broke under passenger of certain kinds of plates, and finally by a coaches, and in another part of the country growing anxiety on the part of dealers in one road broke 300 in freight service. the interior to replenish stocks in anticipa- The question now is not so much safety tion of an improved demand during the as wear, for we find only 25 or 80 broken autumn.

both in England and here these tables are breakage will be reached. A good wheel aware that unusually large shipments are much skill, labor, good material, and,

has old styles, and the wedge thus entered is and we are not likely soon to forget them. Any sustained improvement in the value see an end of hard times, and, instead of men until it splits up the profits on a large of plates will probably have for its basis an improvement in the legitimate consumptive demand, and that will not come until there is an increased activity in the industries which consume plates most

Guaranteeing Car Wheel Mileages.

In a recent editorial upon car wheels, we mentioned the fact that some of the best manufacturers were willing to sell car wheels with the guaranty that they will cannot sell at a fair living profit, and would run 50,000 miles, and agreeing to replace those that fail to come up to this standard. Since that time we have had occasion to investigate, somewhat carefully, the which roads are making, and we find that some of them, while requiring the guaranty, are buying on such terms as to make past. If they can now point the way back it almost impossible for them to obtain good wheels. One of the roads of which we speak has been paying a fraction over \$17-if we are not mistaken, it was \$17.25. At the same time they have been selling old wheels to the same parties at \$2.75 above the market price. The wheels were the wheels were broad tread, and that they had to run over the 4 ft. 8% in. and 4 ft. 9 no allowances for wheels destroyed by guard rails, etc., this was a contract very favorable to the railroad company. In the managers came to the conclusion that better terms were possible, and a contract was concluded with a firm to furnish wheels at a little less than \$13, but with a About two months ago, when tin plates guaranty of 60,000 miles service for each and every wheel, replacing all that failed to make it. To the new parties the old wheels were also sold at an advance of about \$3 per ton above the market price. On the face of it, this looks like a fair business transaction and a good speculation for the company, but we do not think wheels for less than the cost of manufacture. Even supposing a common iron is used, they must cost about \$15.50. The freights in both directions are heavy-distances being considerable—and at the same time the price realized for old wheels is too great. The firm who make these wheels are, to all intents and purposes, insolvent, having no capital nor assets, and some \$90,000 of liabilities. The argument of the road is: If we can get a good wheel it makes no difference to us whether we pay less than it costs or not, and there can be no great loss, since every wheel is warranted. This This year, up to the present time, there is not sound reasoning. It is not economy but at others they take iron not fit to run It must be remembered, however, that in wheels even for gravel trains. The conwheels reported in a year for the whole Statistically, there is no article in the United States. If we go on encouraging metal trade that we know of so easily un- the manufacture of cheap wheels, it will derstood and followed up as tin plates, and not be long before the old averages of kept with the utmost accuracy. Any pal- not only costs money to make, but skill pable excess will soon be known, and and knowledge as well. Nobody has yet dealers and consumers will do well to check been able to make uniformly good and retheir operations from the moment they are liable wheels at a low price. There is too actually made to this country. In former above all, experience required, for it to over supplied market, and any excess was If wheels are sold at a price below the

The establishments running upon the ada were stoves made from stolen patbasis which we have named, have done much to prevent improvements in wheel plained bitterly to us of the course of manufacture, and yet the roads patronize Messrs. Copp in appropriating patterns for them while complaining that wheels are not so good now as they used to be. the Canadian market before they were gen-In the matter of wheel buying, railroads, as the rule, seem to act in a most unwise manner. The wheel maker is compelled to take an old wheel for a new one, often at a price above the market value, and availing themselves of the labor, ingenuthough he takes old wheels, he is not ex- ity, taste and capital of American stove pected to use more than a very small fraction of them in the new wheels he makes. If he gives a guarantee of mileage he is charged with wheels broken by enjoy, while denying to American manubad frogs, by guard rails and the like, all facturers protection for their property faults of the road and not of the wheel. rights in patterns in Canada. These ques-Under these eircumstances, the railroads tions we will not discuss; but mere seems expect good wheels, and complain bitterly to us no question as to the kind of taste because they do not get them, and, perhaps, displayed by the Canadian founders in handicap the manufacturers in the manner we mentioned in the beginning of this in our Centennial Exhibition as Canadian article. The absurdity of such a course, and the impossibility of obtaining a good article in such a manner, would in any

other branch of business be at once recog nized, but here people do not think, or do not, perhaps, comprehend the situation. It seems to us that by far the best plan for obtaining a good wheel would be to rely solely upon mileage made. Take, say, 50,000 miles as the fair average life of a price. The cost of such a wheel is, say, \$17. When worn out, it is worth, say \$5, making the cost to the road of 50,000 miles service, \$12, or say 25 cents per 1000 miles. When a road buys a wheel it pays \$17. When the wheel is worn out it is replaced. Meautime the actual number of miles 1000 miles made by the old wheel. Thus, if the old wheel wore out after a thousand miles run, the new wheel costs but 25 cents, while if the mileage of the old new wheels. A system of buying which shall make the price of the wheel depend upon its service, would be of the greatest value, as it would give the wheel maker, not only an incentive to make the best wheel he could, but also the opportunity to do so, since, if he succeeded, he would receive pay for it, while at present he gets the same money for a wheel that makes 50,000 miles and one that makes 200,000. Manifestly the latter is worth more than four times as much as the former.

In regard to establishments like those mentioned, which are vainly attempting to float themselves by spending capital and selling a poor product at less than the cost of manufacture, we have a few words to say. They are destroying a legitimate business, wasting capital, turning out poor wheels, and are without any hope of doing better hereafter. Every responsible maker in the country knows of such firms, and knows how utterly impossible it is to compete with them. That railway managers should have anything to do with them is surprising. The end is always a loss of money by the company, while the trouble which is brought upon the community extends over years.

Year addian Stoves at the Centennial.

We have the following letter from Messrs. Perry & Co., with regard to the Argand base burners exhibited at the Centennial by Messrs. Copp Bro., of Hamilton, Ontario:

To the Editor of The Iron Age—Dear Sir. Your remarks in The Iron Age of the 22d Inst., would very justly apply to many of the store founders of Canada hat not to the store In regard to establishments like those mentioned, which are vainly attempting to

To the Editor of The Iron Age—DEARSIR: Your remarks in The Iron Age of the 22d inst., would very justly apply to many of the stove founders of Canada, but not to the Messrs. Copp. They purchased from us patterns for the manufacture of the Argand Base terns for the manufacture of the Argand Base burners, as they have also many other patterns, and honorably paid for the same. We have abundant reason to complain of the great injustice practiced toward us by many of the Canadian manufacturers in filing up our best stoves for patterns, and using them without our consent, or payment therefor. In this respect, the Messrs. Copp are guiltless. We know them well, and it gives us pleasure to say that, for intelligence and honorable dealing, they can rank with the best.

Respectfully, yours.

Respectfully, yours, PERRY & Co. ALBANY, June 26, 1876.

We are glad to give publicity to this communication. We had no desire to do any injustice to Messrs. Copp, but the fact of their showing reproductions of five sizes of the Argand was instanced in some remarks by an Albany founder at the last meeting of the National Association, as a flagrant instance of double refined impudence; and as no representative of Messrs. Perry & Co. was at the meeting, no explanation to the effect that the patterns had been purchased was offered. We cannot, however, make any further retraction of what we said before. We know more all than one manufacturer who complained that among these same exhibits from Can- Leather Building.

terns, and one large manufacturer comwhich he had paid, and putting them on erally introduced in the United States. We have no desire to do Messrs. Copp, or any other Canadian founders, injustice. We concede that they violate no statute in manufacturers. They may even insist that they do no moral wrong in seizing an advantage which their laws permit them to lacing stoves made from stolen patterns products.

The Beginnings of the Iron Industry at Pittsburgh.

A correspondent, writing from Pittsburgh under date of June 28th, sends us the following interesting facts concerning the beginnings of iron manufacture in that city

The first rolling mill in the United States for rolling bar iron was commenced in 1816, and wheel for the purpose of determining got in operation about September of 1817. It was on Redstone Creek, about midway between Connelsville and Brownsville, at a place called Middletown, better known as Plumsock, Fayette county, Pa. The property belonged Mr. Isaac Mason, senior, of Dunbar Furnace. Mr. Thomas C. Lewis (my father) was chief engineer in the erection of the mill. George Lewis, his brother, was turner and roller. which the wheel has run have been kept, not estimated. In buying a new wheel It was difficult to get pattern makers and moldthe company pays for it 25 cents per ers for machinery work, so that the most of the work fell on Mr. Lewis, as he was a practical as well as a theoretical mechanic. A better workman never left the shores of Great Britain. He was a Welshman by birth, but never got the encouragement his talent deserved. To show wheel was 100,000 miles, the new wheel the opposition he met with in erecting that mill, would cost \$25. The larger mileage a I will give you an incident. There were two wheel made the more it would cost, and iron-masters from Lancaster county, by the the more it would be worth to the com- name of Hughes and Royer, who went to pany, not only in safety, but also in the Mr. Mason and said it was impossible to saving of time and expense in putting on roll iron. As Mr. Lewis said he could do it, Mr. Mason told them to go to Mr. Lewis and talk to him about it. They did so, and told him what they had said to Mr. Mason. They thought it a shame for him to put Mr. Mason to so much expense, as it might ruin him. "Mr. Lewis," said Mr. Hughes, "you know you can eat." Yes, he knew that. "Well, how do you know it?" He could not tell exactly how, but he knew he could eat. "Well," said Mr. Lewis, "You have done it before, and that is why I know I can roll iron, I have done it before." "Very well," said Mr. Hughes, "go ahead, and when you are ready to start, let us know, and we will come on to see the failure." According to promise, they came and were perfectly satisfied of its practicability. The worst feature of the case was that, after the rull was finished they discharged Mr.

Thirty-eighth street and Rowley avenue.

The Officers of Machinery Hall, Cen-tennial Exhibition.—The following list will be found convenient for reference by exhib-itors in Machinery Hall: John S. Albert—Chief of Bureau of Machinery Hall

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Malum Stetson—Secretary.
J. G. Sanderson—Volunteer aid.
Friederich Ungever—Volunteer aid.
Lewis W. Robinson—Superlutendent
harge of office.

Lewis W. Robinson—Superintendent in charge of office.

Henry Fourfax—Engineer.

Joseph Hirst—Superintendent in charge of Machinery Building.

G. H. Woods—Engineer in charge of southast section of Machinery Building.

Wilson K. Purse—Engineer in charge of northwest section Machinery Building.

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Hall.

John D. Curtis—Engineer of the same.
L. D. Norton—Superintendent in charge
ill boliers and steam pipes.
J. C. Kügore—Engineer of the same.
W. E. Plummer—Superintendent of Shoe and
Leather Building.

[Continued from page 1.]

considered and the mill planned to work steel should it be necessary. Ground was broken at Reading in the spring of 1867, and the first rail turned out in March, 1868.

It was the intention from the inception to make a rail of the very first quality, and, while it was not believed they could be made for any ess cost than the market price of au ordinary rail, the profit or gain was in the enhanced endurance of the product. The result has fully justified the wisdom of the policy, and the expenditure for the plant has been more than returned to them directly by the dollars saved in being their own manufacturer instead of purchasing from outsiders, and indirectly, which is of paramount importance in the longevity of the rail, requiring less frequent renewals of the tracks, and of course, in the expenses for repairs. The nature of the trade being especially destructive to the permanent way. The mill consists of 12 single puddling fur-

naces with a yearly capacity of 6500 tons puddled bars; 8 heating furnaces and 2 reheating furnaces capable of furnishing, in the manner hereinafter mentioned, 20,000 gross tons finished rails annually. It is more especially a rerolling mill. The method adopted for making the was to work about two-thirds old rails with one-third new or puddled iron. Three pieces of old rails are piled on two layers of puddled iron, and heated and rolled into 8 nches and 41/2 inches by 1 inch flats. These form the body of the pile, being piled so as to break joints. The head piece is rolled from a 9 inch square rule of these same flats, heated and rolled into a slab 9 inches wide by 2 inches thick, forming about 22 per cent. of the whole The rail pile thus made up to a section 9 inches square is rolled in three-high 23 inch rolls, until reduced in six passes to a bloom 7 inches wide on the base, 5 inches high and 5 inches wide on the top. The bloom would somewhat naturally assume this shape in course of reduction, but it was more particularly given to distinguish the head part of the bloom from the flange. The bloom is then carried hot to a reheating furnace and wash heated, preparatory to the final rolling, to the finished rail, which is done on a two-high 23 inch train in six passes a total of 12 passes from the 9 inches pile to the rail 41/2 inches high. The use of the puddled iron with the old rails prevents the dryness inherent generally worked iron, and insures, with the wash heating, better welds. The bloom is kept in the reheating furnace sufficient time, minutes, to bring it up to a good welding heat. The bloom going quite hot to the finishing rolls is very completely welded in the first three passes, and as the rolling is done in one direction only, the rolls being too high, it is believed the cinder is nearly all expelled instead of being retained to some extent, by being chased backward and forward, as would likely be done by rolling in both directions on threehigh. After the bloom is thoroughly cemented, the cinder being no longer essential, it is well not to retain it in the rail. It is very evident in the rolling on the two-high train that the rail comes from the last or finishing pass colder than it would if rolled on the three-high rolls, from the fact of more time being required for the rolling, in carrying over the rolls instead of passing through a groove, and thus considerable heat is lost. The colder the rail is rolled in the last few passes the denser and harder will be the metal. In this way an extremely round rail is obtained, with a good welding surface.

All the rails are stamped with date of laying, and as the rails are not sold, but retained for rerolling, it is easily ascertained what the life as been.

The reports of the president of the railroad, made from year to year, since 1868, shows the life of these rails. Out of 9000 tons of rails made and laid in 1868, the first year only 4500 tons, or 50 per cent., had been returned at the end of 1875. Of those made and laid in 1869, 17,000 tons, 4000 tons or 24 per cent. have been returned. In 1870, 17,500 tons were made, 3000 tons, or 17 per cent. were worn out, leaving 83 per cent. in use after six years, having carried some 50,000,000 gross tons, inclusive of weight of engines and cars. It should be stated that at the expiration of the year just named, the weight of the rail was increased from 64 to 68 lbs. per yard. The product of 1871 was 19,000 tons, 92 per cent. being still in a good condition, and of the product of 20,000 tons of 1872, only 61% per cent, has been worn out under a tonnage of 35,000,000 tons. These tests would seem to show the uniform excellence and durability of

Late in 1839 it was decided to make some particular tests of rails manufactured in the usual way, with the exception of leaving the old rails out of the head pieces, and in substituting some special brands of pig iron, worked alone for this purpose. In January, 1870, these were placed where they would be required to carry most of the immense tonnage from the coal regions, and the wear could be carefully noted.

the rails turned out by the process described.

In making these rails a pile was made from muck bar, puddled against soapstone, compressed in the rotary squeezer, and rolled into flats 41/4 and 31/4 by 1/4 inches and piled, break ing joints, 8 inches wide by 6 inches high This is rolled into flats, 414 and 3x1 inches, and formed into a pile of a section 9 inches square Some of these piles were rolled flat or horizontally, and others on edge or vertically, into head pieces or tops, 9 inches wide by 2 inches thick. The body of the rail piece is made up three pieces of old rails, and four pieces pudished rail, was for the purpose of comparing chalcopyrite are of frequent occurrence the two methods. In the horizontal piling pressure more thoroughly welding the head, follows: Twelve varieties of pig were selected for trial, Ga 9 from the Schuylkill Valley, 2 from the Lehigh

and 1 from the Susquehanna.

Pieces were taken from the different kinds after being puddled, and once reworked and tested for tensile strength, the maximum being 66,000 lbs, and the minimum 45,000 lbs, to the square inch. They were divided into three classes, the neutral irons, with a tendency to cold-shortness, gave an average of 63,200 lbs., the red-short 60,700, and the cold short 52,500 lbs. These were again arranged in two lots, those with heads rolled flat and those with heads rolled vertical, and the tounage, including weights of engines and cars actually carried by each kind before it was worn out, was as fol-

	1	Rails with leads rolled flat.	Rails with heads rolled vertical.
ı	Total average	25,324,348 26,954,808 22,412,593	30,040,670 22,819,300 28,789,361 33,472,600

From this we gather that the cold-short irons olled on edge show on an average the most endurance. The parcel of rails doing the best was removed after six years of service, during which time 55,000,000 tous passed over

The hard, fine grained, cold-short irons are nore durable than the softer and stronge fibrous irons of a red-short nature. cold short irons appear to give the best welds, and the stronger they are the better The iron in the heads of the rails bearing the maximum tonnage was from a blast furnace in the vicinity of Reading, and was smelted from a mixture of 60 per cent. East Pennsylvania hematites, 25 per cent. Tilly Foster, and 15 per cent. East Run magnetic ores

Phosph	or	u	8									,		*											*4
Silica.							,	,	. ,	,						,									.8
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In the same track with these experimental rails were laid some rails with the heads formed of a solid hammered bloom. These gave a tonnage of 28,000,000 tons; as the iron was too soft from the lack of sufficient, rolling they mashed out in spots under the heavy traffic. Puddled steel headed rails have done much better

While admitting the vast superiority of steel for rails required to stand a very heavy traffic, iron, if carefully selected and properly manufactured, has capacity for which it seldom gets credit.

THE SOUTHEAST MISSOURI LEAD DISTRICT.

By Professor G. C. Broadhead, of Pleasant Hill, Mo. The lead district of Southeast Missouri overs an area of over 3000 square miles. A general section of the rocks of the southeast part of this region would be about as follows, numbering from the lot:

ering from the lot:			
	F	'ee	t.
Sandstone (the 2d of Mo. Geolg.)			20
Chert beds (beds of passage below)			125
Magnesian limestone, chert and quartz-			
ite	100	to	300
Lower magnesian limestone	100	6.6	150
Gritstone and lugula beds			50
Ozark marble beds	5	0.6	20
Sandstone and conglomerate	5	6.6	90
Gravite Archaean			
The thickness is approximate			

The oldest rocks in Southeast Missouri are the porphyries and granites. We know that the former are older than the above named rocks, because we have found the lowest sandstone resting unaltered on them and also upon the granite. We also have found the lowest magnesian limestone resting on this sandstone, and also unaltered upon the por-phyry. We therefore have a correct succession of rocks. Our data thus far is not sufficient to establish the age of the granites, or whether they are older than the porphyries, but we incline to the belief that they are. Our prophyries, though, are exactly similar to those of Massachusetts and New Brunswick, which are considered Huronian. We therefore feel correct in calling ours Huronian. Our grant be Laurentian.

The ores of Nos. 4 and 5 include those of lead, copper, nickel and cobalt. The oldest worked mines are those of Mine La Motte, where lead was mined soon after 1730.

At intervals these mines have been much worked during the present century. The ore occurs disseminated in horizontal limestone beds throughout an average vertical thickness of 71/2 feet. The cap rocks and bed rock are of like composition, but contain very little ore. In one portion of the mines copper ore (chalcopryite) is quite abundant, and is intimately associated with the galena. At another place we find nickel and cobalt quite abundant. At the Avon and Fox mines the ore occurs very sim ilarily, and the formation is of the same geological age. At the Fox mines much of the galena is found in drusy cavities, associated

with pyrites, calcite and dolomite. At the St. Joe Mines the rocks are similar to those of Mine La Motte, but the ores are only of 41/2 and 3x1 inch flats, rolled from a pile of lead and copper. The St. Joe Company at pres ent have two working shafts of 80 and 100 feet dle iron. The rail pile, thus made up of a sec. depth, the ore bearing rocks being the lower tion 9 inches square, is rolled into a bloom 7 25 feet, arranged in tolerably uniform layers of inches square at base, 4 inches on top, and 6 2 to 4 feet thickness. No rertical veins were inches high, with the head at the top, and observed, but the mineral will sometimes folcharged into a reheating furnace, and was low vertical cracks. At one place solid layers heated before final rolling in the two high rolls of galena of about 3 inches thickness are into the rail section. The rolling of some of the tercalated with the limestone beds every few piles for the heads, on edge, so as to bring the feet, but the ore is generally disseminated in lites, galena and blende.

welds vertical instead of horizontal in the fin- the limestone. In the upper beds hands of

Just adjoining the St. Joe land, and only a few most of the failures arise from lamination. The | hundred feet northeast, the Missouri Lead Min best results followed from the edge rolling. ing and Smelting Company have sunk a shaft The welds, although vertical in the heads of 120 feet, and bored 84 feet further, passing the finished rails, are in practice rolled horizon- through rich galeniferous limestone, a section tal, from the manner of the rail going through recorded by the company reports passing the last three passes on its side, the vertical through limestone with disseminated galena as Feet from Surface

Jalena	at		3116
**	at		46
11	at		78
3.4	very rich 78	to	80
3.7	at		81
99	a little from	10	97
54	richly disseminated	to	164
6.0	sparsely	to	111
>6	a good per cent	to	116
79	a very little to	0.0	117
2.6	a good per cent. from	to	127
84	dis-eminated129	Ea	138
64	very rich128		140
44	disseminated		
94	fair "140 9		
11	very rich per cent	to	142
15	disseminated	10	151.6
44	very rich		
4.4	good disseminated	0.3	154
11	lenn		155 6
1.0	rich disseminated		
13	lean "		
1.	very rich " 187	to	158
15			159
61	lean "		161 : 3
6.5			164
14	a little ore		
14			167
**			175
+4			182
44	disseminated184		194
44	very rich		197
44	some mineral		204
Born	g stopped.	10	WU.S.
200111	of acobbon.		

The limestone here lies about horizontal, and it is impossible at present to estimate the prob able extent of the galena, but it is undoubtedy very great. gulena at St. Joe, as at other mines,

in the lower limestone, is coarsely gran-ular, and cubes are of rare occurrence, but in small drusy cavities very rich crystals of a secondary form are often found. Iron pyrites, dolomite and calcite abound at the Fox nines. Calcite and dolomite are of general ocurrence. Barytes, if at all seen, is very rare. With regard to the origin of the galena in ese mines, we would give as our theory that the limestones were first formed in deep seas. That after and during a long period of subsequent time, the galena, in a state of solution, replaced a portion of the limestone beds which had previously been softened by acids. We would not hazard the opinion that the process of replacement was recent, but rather believe it to have taken place in some remote period of time, and probably before the deposition of the galena among the more recent formations of Southeast Missouri; also, that its formation must have continued through a long period of time, for the galena did not replace the limestone in the different beds at the same time, nor is it certain that the process was in progress in different beds at the same time.

Some of the mines of ounty, for instance the Valle mines and all of those of Washington and Crawford, occur in the third magnesian limestone. occurs either: First, in caves or openings;

econd, in leads or lodes. Although there may be a slight difference in the form or shape of the deposit, still I believe that all the galena ores of this formation, excepting the leads, may come under this head, nor am I certain that the vertical leads should be separated. The limestones are often bisected by vertical cracks or fissures crossed by others. These are sometimes narrow, but are often widened out, probably caused by breaking off, and disintegration of masses of limestones. The ore and its associated minerals is limited by "runs" and "openings." The run is a

widening of the opening, and must not be con-

founded with the runs of Southwest Missouri. At Prairie diggings, on "Old Mines" tract, we entered a run 7 feet wide at 55 feet depth, exending in a nearly northern direction, os far as explored, for several hundred feet. Other short runs or cave openings ment the main run, but generally terminating within a few feet. Others extending further developed into similar openings to the "main run." These "runs" or openings" are filled with masses of decomposed magnesian limestone, barytes, iron pyrites, galena and calcite sometimes, confusedly arranged, but often in regular broken horizontal layers, the galena generally preserving a nearly horizontal position in its arrangement. and when disseminated it is found occupying very nearly the same horizontal line. galena is sometimes inclosed by bands of pyrites, and at other times associated a gangue of barytes, the latter apparently of more recent age.

The ore at Mineral Point occurs very similar and in irregular shaped openings. mode of occurrence of ores at New Ishmael. or Palmer tract, is very similar to the last, and to the other just above named. At Mammoth mines, in Jefferson county, beautiful specimens can be obtained crystallized.

The Sandy mines occur in what is known as the second magnesian limestone. At these mines is found a nearly vertical fissure, varying from a knife-edge to 15 inches wide. The wall rock ts magnesian limestone. The fissure is filled with a gangue of barytes with galena, and has been worked with variable success for many years. The course of the main tissure varies but little from a north and south line, and has been traced for several miles.

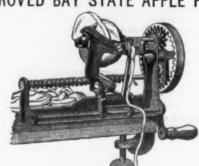
Of a similar character is the Jones' mine, 15 miles southeast of Versailles. The vein varies in width from 4 to 18, and includes a gangue of barytes, in vertical sheets, crystallized at their innetion, and being galena near its southern exposed portion. It can be traced for threequarters of a mile north and south. The vein can be easily traced out, but only near its southern exposure is galena found.

In Beaton county we find a similar fissure vein, and being nearly the same magnetic course which has also been traced for threequarters of a mile. Its minerals are iron py-



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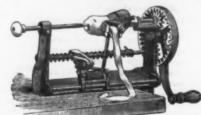
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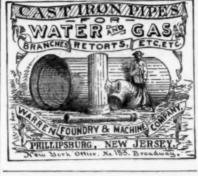
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Main Building

THE HART, BLIVEN & MEAD MANUFACTURING COMPANY,

of Kensington, Conn., and 18 and 20 Cliff street New York city, have placed in the Centennial Exhibition, at Philadelphia, an extensive line of samples of their productions. They are located at P. 69 and 70, in the southeast end of the Main Building, near the south avenue, and cover a space (a portion of it occupied by the Branford Lock Works), 56 feet long and 7 feet wide, with avenues extending around all sides, and passages leading from the South avenue directly to the exhibit. The walnut cases in which the larger portion of the samples are shown contain 36 sample boards-18 in the upper and 18 in the lower section, tastefully arranged. The lower or table portion of the cases are slanting in form, and rest upon fluted piano legs, standing on a handsomely carpeted tempt at ornamentation, the exhibit is at once floor. The upper cases, which are perpendicular, are separated from the lower ones by a neat black walnut cornice. The whole is surmounted in great variety of styles; ornamental bronze by an elaborately carved and gilded sign extending the entire length, and lettered on both sides. At one end are pyramid shaped sample boards of Connell's celebrated gong bells. These are placed upon three wings, set on a turn-table, which revolves by means of a clockwork, and attracts general attention. At the other end of the long line of sample cases is their office, neatly furnished with writing key to pass the whole, and master key to differ desks, chairs and copies of the Hart Bliven & Mead Manufacturing Co's and Brauford Lock Work's catalogues. For the convenience of their customers who visit the Exhibition, they key to pass the whole set, and key operating in have placed a post office box in the office, to which there are eight daily deliveries. Around the whole structure is a handsome double bar nickel plated railing, between which and the sides the sample cases are placed samples of heavy goods, such as shovel and tongs stands, andirons, barn door trimmings, &c. The samples inside and outside the cases are divided into different classes as follows:

Carpenters' Hand Tools, viz. : Socket, firmer and framing chisels, corner chisels, carpenters' slicks, carpenters', coach makers', wagon makers' and farmers' drawing kuives, screw drivers and scratch awls. Steel, iron and nickel plated carpenters' squares, etc.

Hardware used in Construction, Commonly Called "Builders' Hardware," viz. : Cast bolts, hinges, pulleys, sash and door fasteners, cupboard turns and catches, bat, coat, wardrobe and bird cage hooks, store door, trunk and chest handles, gate and thumb latches, drawer pulls, shelf and flower pot brackets, furniture casters, barn door trimmings, etc. These goods are finished in japanned, coppered and enameled iron, brass, silver and nickel plated and bronze

Carriage Hardware, viz. : Iron, brass, oroide silver, nickel and gold plated carriage bands, shaft, neck yoke, whiffletree and pole sockets, coach handles, dash rods and collars, spring bar bolts, japanned and silver carriage knobs

ers' Hardware, viz. : Japanned, figured enameled, bronze metal, nickel plated and verd-antique paper clips, paper files, check cancelers, paper weights, inkstands, pen racks, match safes, twine boxes and book racks.

House Furnishing Hardware, viz. : Brass and nickel plated andirons, japanned and enameled fire dogs, blower stands, shovel and tongs stands, kitchen sets, japanned, polished, brass and nickel plated shovels, tongs and pokers spiral spring coal tongs, cleavers, steelyards, coffee pots and sad iron stands, toilet racks, boot jacks, etc.

Gong Bells, viz: Bronzed and enameled, steel, polished brass, nickel and silver-plated, and bronze bell metal door and trip house bells, with crank, pull and thumb latch handles.

The foundation of the Hart, Bliven & Mead Manufacturing Company dates back just thirtyeight years ago. Mr. J. T. Hart, the vice president, commenced to manufacture a few articles in Connecticut in 1838, and the same year Mr. Charles Bliven commenced the sale of American hardware in a limited way in the city of New York. Mr. Edward B. Mead, the treasurer, joining him a few years later. In 1854 the present corporation was formed; the parties above named being then as now, the principal owners of the company, and are to be found every day active in the business. The managers of the company claim that none of the 1600 samples of different articles shown in the space allotted to them were made for the purpose of the Exhibition, but are strictly business samples, each one having its proper number and list price attached, and that the whole aim and object of their exhibit means business. The exhibit is in charge of Mr. Charles J. Bliven, the general manager of the company, who is in daily attendance at their Centennial office.

THE BRANFORD LOCK WORKS,

Brauford, Conn., have their sample cases arranged in similar style to those of their agents. the Hart, Bliven & Mead Manufacturing Co. They contain 16 sample boards, on which are arranged 500 samples of mortise and rim locks, latches, knobs, etc., Among articles to which they call particular attention is their patent undercut mineral and porcelain door knobs, whereby they claim that the fastening of the top to the neck of the knob, makes them the most durable and best secured knobs in the market. Their rim and mortise locks are all made with a lever and straight spring operating the latch bolts, which they state are less liable to break and get out of order than the bowed springs used by other makers Patent telescope rim night latches, and locks with flat steel keys, and self adjusting cylinders extending for doors varying from 1% to lock, the neck of the knob and the escutcheon

The above two exhibits occupy the largest space, the Branford Lock Works.

MALLORY, WHEELER & CO.,

New Haven, Corn. This firm have a display of locks, which in extent, variety, neatness and general excellence, fully maintain the reputation of this well known firm. The case in which the exhibit is made is of black walnut, with plate glass front, and silver-gray maple back, upon which the goods are arranged. The effect is very pleasing, and while there is no atattractive and interesting. The display in cludes every description of door and pad locks fronts, mortise locks, with knobs to match ornamental English bronze locks, both rim and mortise, with knobs to correspond; brais and iron front mortise rim locks, etc., etc. A coding feature of the exhibit is in hotel locks, this firm having a large line, including rim and mortise locks with four tumblers, which are in sets of 140 or less, all different, with master in each set. The makers claim that these are the only locks made with a plurality of tumbsame key-hole both sides of the door. They also exhibit a cheaper line of master keyed locks with less tumblers and changes, which makes their line of this class of goods very complete. We are informed that these locks are very popular, and are used in many of the new hotels in Philadelphia, as well as in leading hotels in other parts of the country. Another very prominent feature is their display of padlocks, the line being large, including every variety of style and finish, and in keeping with other portions of the exhibit, which is large, interesting and attractive.

THE DOUGLASS AXE MANUFACTURING COMPANY, Boston, Mass. This firm make an exhibit which attracts the attention of every visitor to that section of the building in which they make their display. The exhibits are attractive in themselves, but the setting and general arrangement is so effective that the attention of the most casual observer is at once arrested. The case is of black walnut, carved and ornamented in the most artistic style, and is probably one of the finest in the building. On one side there is a superb representation of an Indian with his tomahawk, and on the other side a backwoodsman with his axe, both very appropriate in connection with a display of this kind, while the carving is in the highest style of art. The display is arranged with great taste-quite in keeping with its surroundings. Every description of edge tools manufactured by this firm is exhibited, axes, adzes, hatchets, mattocks, picks, &c., and, by way of contrast, an axe of 1826 (never used), is placed with them. In the upper portion of the case an elegant little casket is to be seen, which contains five medals, trophies of successful competition, in previous home and foreign exhibitions.

THE GAYLORD MANUFACTURING COMPANY, Chicopee, Mass., make an exhibit which, though small, is one of great elegance and special merit. The leading feature is in swords buckles, &c., which are of great beauty, and very attractive. They also display a full line of cabinet locks, which will fully sustain the reputation of the firm for this class of goods.

THE UNION MANUFACTURING CO., New Britain, Conn., and No. 98 Chambers street, New York, show a handsome case of ornamental and plain butt hinges in great vari-This company claim to be the pioneer of the drilled milled and wire-jointed system which has revolutionized the manufacture of these goods, placing on the market the elegantly finished butt hinges of to-day at nearly as low a figure as the old common cast teat butts. Aside from the greatly improved finish which the present system of butt hinge manufactur affords over the almost obsolete method, referred to above, the drilled and wire-jointed goods possess the great advantage of not allowing the door to sag. Among the butts manufactured by this company we notice cas drilled, fast and loose joints, japanued of all kinds, silver tipped, with and without acorns, solid bronze with and without caps in fast, loose, or loose pin; japanned and silver tipped parliament butts for inside blinds, etc.; enameled and nickel plated for same pur pose. They also show a new style of figured japanned butts, which is of very handsome design. This house has recently added to their specialties a newly invented spring hinge, both single and double acting, which is very efficient for its purpose. It has two coiled springs, a solid pintle and solid milled bearings, and can be used for either right or left hand doors. They are made japanned, nickel plated, and in solid bronze. The display of butt hinges by this company is very fine, and would surprise the uninitiated in the mysteries of the hardware trade with the wonderful detail and almost infinite variety in this branch of the business. In the pump department of Machinery Hall the Union Manufacturing Company make another very creditable display of goods, showing a large line and great variety of pumps, suited to almost every conceivable purpose. Among the pumps shown by them are iron, brass, brass cylinder, galvanized and nickel plated goods. 31/4 inches thick. Also the Gilbert patent They manufacture about 600 different styles of

sizes of hydraulic rams. They also show power force pumps for factories, mines, etc.; and contain the most complete line of legiti- garden and fire engines, boiler feed pumps, and mate samples that we have seen in the Hard- brass and iron ship pumps of the latest ware Department of the Exhibition. They are and most approved designs. This house noticeable, not only for the good taste shown in manufactures 12 sizes of brass and iron their arrangement and classification, but as an hand and rotary pumps, and a large variety of exhibition of articles of prime necessity in the wind-mill pumps. In the arrangement of the trade they represent. The exhibit is conspic- latter they have made such improvement as uous for its great variety and the common enables them to fit up any standard with windsense fivish of everything presented. Mr. Chas. mill tops or attachments. They also have on J. Bliven is also in charge of the goods of the exhibition drive well points, lower working cylinders with bolt and screw attachments, single and double-acting. Of their new "Centennial" pumps ten styles are made, adapted for house or outdoor use. Among their other specialties not mentioned above, are aquarius ale and beer oumps, plumbers' force pumps, water charge and sand holders, check valves, air barrels, strainers and rests, &c. This company claim that their method of attaching barrel to base in their pumps by means of a brass nut, is an invaluable improvement ever the iron nuts in ommon use. The pumps on exhibition are taken from their regular stock, and although the assortment shown is not as large as some others, enough are displayed to give a fair representation of the style and finish of their leading specialties in these goods.

SPILLER BROS.

St. Johns, N. B., exhibit socket and tanged firmer chisels, framing chisels, slicks, broad axes, Latchets, mattocks, machinists' hammers, drawing knives, coopers' tools and carpenters' hammers, &c.

BOIVIN & COMPANY,

Quebec, exhibit axes and edge tools, with both handles and blades painted and lacquered more gaudily than is the custom with American makers.

DATES PATENT STEEL COMPANY

Niagara, Ontario, show some excellent patterns of the following tools, in good commercial finish: Axes and mattocks, broad hatchets and axes, carpenters' lath and shingling hatchets, slicks, coopers' adzes, butchers' cleavers, carpenters' hammers, &c.

COWAN & BRITTON

Canoque, Ont., exhibit strap and Thinges, gate hinges, &c.

CARVEN GILMORE.

Montreal, exhibits a case of augers and auger bits. These goods are shown in several patterns. This case also contains specimens of pump boring augers. All the goods are well finished, and will compare favorably with any similar hardware on exhibition.

JAS. WARNOCK & COMPANY,

Galt, Ont., show samples of springs and edge tools; also sets of tanged and socket firmer chisels, long thin firmers, framing and corner and hatchets, broad axes, picks, mattocks, carwith those of American makers.

R. H. SMITH & CO.,

St. Catharines, Ont., make a very handsome exhibit of saws, and state that their goods are made of Wm. Jessop & Sons' Sheffield steel. The following varieties of saws are shown, and are well and carefully finished : hand, panel rip, back, compass, pruning and keyhole saws, butchers' bow saws, circular saws in great variety, from 136 to 72 inches in diamter; concave saws, veneer segments, mill, mulay and gang saws, cross-cut saws with fast cutting teeth; one man cross-cuts, and billet, turning and felloe webs in great variety; plastering trowels and patent cross cut saw handles.

J. M. WILLIAMS & CO.,

Hamilton, Ont., exhibit plain stamped and japanned tinware, water coolers, lanterns, toilet sets, grocers' canisters, cake boxes, and specimens of deep stamped and retinned goods.

D. F. JONES & CO.,

Gananoque, Ont., show a large assortment of shovels, spades and scoops and hay and manure forks.

A. S. WHITING MANUFACTURING CO., Oshawa, Ont., make a beautiful exhibit of hay, manure, spading and other forks, hoes, rakes, &c. Some of these goods are shown in good commercial finish, and others are extra finished. The assortment, any similar goods in the Exhibition. They also exhibit a large assortment of scythes, grass

hooks, corn and hay knives, and four prong wood barley forks. H. R. IVES & CO.,

Montreal, exhibit handsome specimens of cast iron roof cresting, cast iron finials, composite iron raiting, ornamental iron posts and railing, and ornamental wrought iron gates in handsome and original designs. They also show a case of silver-plated coffin trimmings, and a good line of cast iron hardware, including brackets, drawer pulls, cupboard turns, barrel bolts, door latches, square bolts, barn door hangers and rollers, bench screws, hat and coat hooks, axle or frame pulleys, clamps, inside and outside blind hinges, chain boits, screw pulleys, sash fasteners in Berlin or ornamental bronze; furniture casters, twine boxes, sad irons, cork squeezers, boot jacks, &c. All these goods are finished in the ordinary manner of the trade, and look like fair samples from stock.

STARR MANUFACTURING CO.,

Halifax. N. S., show a handsome case of Forbes' Patent Acme skates. The variety of sizes and styles of finish is large, and the goods are beautifully finished and tastefully dis-played. The lowest grade of goods on exhibition is their No. 5, which has malleable from upper and plainly finished steel rupner, without lacquer or any attempt at ornamentation, and withal an elegant common sense skate. The

some silver-plated skate, and is the same as No. , with the difference of the plating. They also exhibit a silver-plated skate, No. 12, but the Philadelphia, show a handsome case of tailors' difference between it and the No. 10 is not apparent. No. 14 has the same silver-plated runners as Nos. 10 and 12, with the upper portions gold-plated, and is a very elegant article. They show some of these fine skates with ornamental heads, such as birds, horses and dogs. They say of this skate that it is "the only reliable and really self-fastening skate ever in vented-can be instantly and firmly attached to ny boot-no straps to lame the foot-no heel plates to clog up.'

THE STANLEY RULE AND LEVEL COMPANY, New Britain, Conn. This firm make a display of their manufactures in the Main Building, which is justly admired, and is the subject of favorable comment by all who give the exhibit a critical examination. The display is arranged with much taste, and is among the finest of its class. The exhibit includes boxwood and ivory rules, plumbs, levels, try squares, bevels gauges, spokeshaves, Bailey's patent iron and wood planes in great variety, plane Irons, etc., all of which combine beauty of style and high finish. Among the various tools we notice Miller's patent combined plow, filletster and matching plane, which is a most ingenious and successful combination of the common carpen-ter's plow and adjustable filletster, and a perfeet matching plane. The patent tonguing and grooving plane is another useful article, cousisting of two separate tools, which are always used in connection with each other, and are here combined in one, thus affording two superior tools in a cheap form, and occupying no more room than one ordinary tonguing or grooving tool. The stock of this tool is made of metal, and it has two cutters fastened into the stock by thumb-screws. The guide or fence, when set, allows both of the cutters to act, and, the cutters being placed at a suitable distance apart, a perfect tonguing plane is made. The guide or fence, which is hung on a pivot at its center, may be easily swung around, end for end. Thus, one of the cutters will be covered and the guide held in a new position, thereby converting the tool into a grooving plane. A groove will be cut to exactly match the tongue, which is made by the other adjustment of the tool. The guide or fence is hung for grooving boards planed from 1 inch stuff, and on these the tongue and groove will both come in the center of the board. Boards varying from % to 11/4 inch in thickness can be matched equally well, by working the planes so that the tongue and groove shall both come at their regular distance from one end of the boards to be matched, leaving the distance to the other edge to vary as it may. One extra chisels, drawing knives, in various styles; axes width cutter accompanies the tool, to be used on the outer side of the tongue, in tonguing penters' slicks, &c. These goods are well and boards thicker than those planed from 1 inch sensibly finished, and the styles correspond stuff. The last article we shall notice is the patent improved miter box, the peculiar features of which are as follows: The frame is made of a single casting, and is subject to no change of position, being finished accurately at first, it must always remain true. The slot in the back of the frame, through which the saw passes, is only 1/6 of an inch wide, thereby obviating any liability to push short pieces of work through the slot when the saw is in motion. This miter box can be used with a back saw or a panel saw equally well. If a back saw is used, both links which connect the rollers or guides are left in the upper grooves, and the back of the saw is passed through under the links. If a panel saw is used, the link which connects the rollers on the back spindle is changed to the lower groove, and then the blade of the saw will be stiffly supported by both sets of rollers, and be made to serve as well as a back saw. By slightly raising or lowering the spindles, when necessary, the leaden rolls at the bottom may be adjusted to stop the set screw the spindles on which the guides revolve may be turned sufficiently to make the of any thickness. If a narrow saw blade is

> from under them. BUCK BROTHERS.

ased, or if the saw blade becomes narrower

from use, the rollers may be lowered on the

Millbury, Mass., make a handsome display of edge tools, which are entered for competition. Their goods are shown in a handsome silverplated case, 91/4 by 21/4 feet, in which are tastefully arranged samples of the following goods: Sets of cast steel firmer chisels and gouges, paring chisels and gouges in sets, one set of cast steel turning chisels, one set of cast steel turning gouges, etc. Their exhibit of socket chisels is very handsome, and comprises socket firmer chisels, gouges and framing chisels in sets, samples of millwrights' socket firmer chisels and gouges, corner chisels, carpenters' slicks and flat and middle sweep gouges. They also present specimens of their London pattern screw drivers, screw driver bits, reamers, and countersinks: best quality pail sets, punches and cold chisels, carving chisels and gouges, straight, curved and short bend; a fine assort ment of plane irons, etc. These goods, which are all well finished, are, we are informed, fair samples of their regular stock. They are placed in a position that affords opportunity for a critical examination, and we think they will stand the test and compare favorably in style, finish and variety with any similar display on exhibition.

THE LAMSON & GOODNOW MANUFACTURING CO., 88 Chambers street, N. Y., make a very handsome exhibit of table cutlery, showing the shaft is pumped out and is ready for use. largest assortment of fine quality carving knives and forks that we have seen. Of finely finished table and dessert knives, in cases, next grade is styled No. 7, the upper of which is they make a beautiful exhibit, showing these largely in the St. Gotthard Tunnel, and also lock, the neck of the knob and the escutcheon pumps, including 50 styles of yard pumps, next grade is styled No. 7, the upper of which is being cast in one solid piece of metal, and the single and double-acting house pumps, and 7 the same as No. 5, with the exception that all goods with silver-plated, ivory and pearl employed in the great bore at Mt. Cenis. It is

the edges are polished. Their No. 10 18 a hand. handles. In their medium and cheap grades of table cutlery nothing is shown.

L. HERDER & SON.

shears and scissors, bent shank and blade shears, trimmers, etc. All of these goods are well finished.

THE WATERBURY BRASS CO.,

Waterbury nd No. 52 Beekman street. New York, make a very showy exhibit. Among their goods we notice copper rivets and burrs in all sizes, bress rivets, percussion caps, gun wads, eyelits, game bags, shot pouches, leather case measuring tapes, pocket measuring tapes in German silver and composition casing; a fine assortment of powder flasks in copper, German silver and metal, covered with hog skin; pistol flasks, shot flasks, whistles, powder and shot flask furniture, brass kettles, &c. Beside the above mentioned goods they show a full assortment of sizes of brass and copper wire, sheet brass and brass and copper rods.

LEONARD BAILEY & CO.

Hartford, Conn., show a handsome line of their "Victor" iron planes. They also exhibit "Langdon" miter boxes, boxwood and ivory rules, made by Stephens & Co., of Riverton, Conn., and spirit levels in great variety.

Mining and Metallurgy at the International Exhibition.

embraces fron, nicke!, cobalt and silver in its metallurgical contribution. The impressive feature is a trophy erected by the Cathrineholm Iron Works, representing an ancient ship or "viking," the prow and deck being of plate iron, and the mast and the spar are formed of hammered bars of various sizes. On either side of the mast are ladders made in imitation of rope of knotted and twisted bar iron, bent cold to show its elasticity and strength, and they are really remarkable. On the deck of the "viking" a mailed officer stands with a club in hand made of knotted and twisted iron; behind him is a cabin com-posed of a pile of various sized hemmered ars, and in front of him are heavy anchor chains. The get-up of the affair is worthy of notice, and is a novel way of illustrating the product of the works. Around the hull there is quite a collection of projectiles, while to the sides of the vessel are hung round shields, ornamented with nails, spikes, punching, &c. Behind the vessel is a case of various sized nails and spikes.

Raw and calcined nickel ores and the products of them are displayed by the Bamble Nickel Works and the nickel works of Ringenget, and the Kongsberg Silver Works exhibit a large collection of argentiferous rocks, native silver, models of nuggets and ingots, which are quite interesting. There are several fine geological maps and sections, and a number of specimens of the different rocks are exhibited

contributes some interesting features of

mining and metallurgy, but the display is

in connection with the maps. BELGIUM

not as comprehensive as might be expected from a country producing more than one-fifth as much iron and one-third as much coal as the United States. The most prominent feature of the mining display is in Machinery Hall, and consists of the apparatus employed by Mons. T. Chandron in sinking coal shafts. This is simply an artesian well boring apparatus on an immense scale, and is composed of the following parts. A trepan weighing 15 tons, made of forged iron and fitted with cutters secured by taper keys, so as to make a cut 6 feet long. This trepan is raised about 3 feet by steampower and then dropped; at each lift the rod being turned so that the tool cuts out a circle saw at the proper depth, and by the use of a 6 feet in diameter. This sized tool has penetrated in the softer sandstones one meter per day. A massive iron bricket, or saw pump, fits into rollers bear firmly on the sides of a saw blade the cut thus made, and is used, when the tool is withdrawn, to remove the debris. After the first tool has penetrated about 30 feet, the second trepan is substituted. This is a tool conspindles by removing some of the brass rings structed similarly to the first, but is much heavier, and is 16 feet long, with a central guide working in the opening made by the first trean This tool has followed : at the rate of a foot per day. The presence of water does not interfere, but rather is an advantage in boring the hole; and for the purpose of recovering the tools, or cutters, if broken, there are three tools on exhibition, viz. : A grapple for broken rods, a sweep to catch the sections of lifting bars, and a grapple to remove broken cutters or troublesome stones. This latter is remarkably ingenious, and consists of a pair of double lazy tongs, so arranged that when lowered the arms stretch to the sides of the hole, and when raised they scour the bottom, and pick up the troublesome cutter or stone. To prevent breakage, the trepans have a sliding motion on the suspending bar, thus permitting the shock of striking to be expended without injury. When the cutting is ready for lining, circular plates are let into the opening, the bottom plate or cylinder sliding inside of the second ring, and being surrounded with a moss gasket, which is compressed between the flanges, forming a means of keeping water out at the bottom. The second ring is provided with a convex bottom, and it therefore floats on the water. As ring after ring is added, the water is allowed to escape, so as to permit the rings to sink gradually. Suitable guides keep the easing from tilting until it is finally secured upon the hard, impervious strata, when the

Adjoining the Chandron apparatus is an interesting exhibit of the rock drilling car of Mons. Dubois et Francois, which was used a compact arrangement of four independent the effect of the shape of incisions upon the drills, operated by compressed air, placed on a ultimate strength of iron. carriage and provided with proper facilities for vertical and lateral motion, and also for rotat- Mills, prepared as plain cylinders inside the ing the drills. A model of a safety cage for heads, with the exception of three grooves ac mining shafts, and some iron sills for mine rail- curately cut to a uniform depth in a lather ways, also form a part of the Belgian mining These grooves were rectangular, curved and V exhibit. These sills are flat iron bars, bent so shaped. as to form chairs for the rails at the proper gauge; the rail being secured by simply driving of the specimens, with dimensions in inches a wooden wedge between it and the bent por- and decimals. tion forming the chair.

some fine specimens of argentiferous lead ores were threaded and heads screwed on for the yielding over 80 per cent. of lead. The rest of second test, and in the same manner for the the metallurgic display consists of sections of third. Below is the result giving lbs. per sq. in. beam, channel and angle irons, wrought iron of section at which they broke in each groove riveted girders, axles, rails, nails, spikes, tacks and wire. The usual exhibition of toughness by twists and bends is not overlooked by the Belgian contributors; and one display of beams, etc., has on top of the case in large letters "delivered free on board in New York for \$40 per ton." Some of the plate iron on exhibi-tion displays remarkable qualities, and a rack of sheet iron is, to all appearances, equal to the Russia sheet.

Some American Irons.

To the Editor of The Iron Age: Notwithstanding the reported national pride and boastfulness, our people seem very slow to realize the fact that we can, and do, make just as good, if not better, iron and steel, as is made elsewhere. This is not a mere idle assertion, but is supported by a great quantity of care fully made tests.

I had occasion about three years ago, as assistant inspector of the St. Louis bridge, to make a considerable number of critical tests of the superior strength of one form, and to leave iron and steel, as well as to become acquainted the relative weakness of the other two in with the results of those made by other engineers for that and other structures.

In connection with the article on "American and Foreign Irons" in your issue of June 15th, the following extracts, from my records may prove interesting :

Tests of United States iron manufactured by Vayne Iron and Steel Works—1/4 in. boiler

plate.
Tested by C. A. Uber, U. S. N., Inspector Louisiana bridge, on one of Riehle Bros.' ma-

ines (be						
No. 1	broke	at	68,000	lbs. per	sq. in	١.
No. S	3 46		67,600	46	44	
No. 8			80,400	6.6	66	
No. 4			64,000	4.6	46	
No. 5			60.000	41	66	
No. 6			68,000	46	66	
No. 7			65,000	6.6	66	
No. 8			76,000	6.6	66	

No. 8 " 76,000 " "
At another time No. 1 broke at 83,000 lbs. per sq. in.; No. 2 broke at 73,500 lbs. per sq. in.
Another single specimen at 76,000 also.
"19" with upset heads, tested by C. A. Uber, Louisiana bridge, and C. S. Dutton, St. Louis bridge, on St. Louis hydraulic machine:
No. 1, sect. area, "7843 in., broke at 71,421 per sq. in.; ruptured area, 5135 in.
No. 2, sect. area, "7885 un., broke at 69,783 per sq. in.; ruptured area, 4901 in.

All of these specimens could be bent or twisted cold in any shape, and showed when broken, a very finely fibrous fracture. As some have insisted that this brand of metal was properly a steel, and as there is a considerable difference of opinion as to what distinguishes



steel. I append a copy of a chemical analysis of two specimens of this iron. I am accustomed to recognize only as steel such specimens as show a finely crystalline fracture :

ANALYSIS OF UNITED STATES BRAND IRON BY PROP. GEORGE HAY, ANALYTICAL LABORATORY, ALLE-GHENY CITY.

	Plate.	Bar.
Iron	99:421	99:710
Combined carbon	388	minute trace
Graphitic carbon	trace	-632
Silicon		
Sulphur	minute trace	'001
Phosphorus	.063	.071
Manganese	1029	.069
Aluminum	minute trace	minute trace
Copper	1003	1003
Minute traces of other matter, loss, etc	.010	.018

question recently mentioned in The Iron Age- | are shown in the tabular statement below.

We had three bars from the Union Iron

The annexed figure shows an axial section

Each specimen was pulled until it broke in In the Main Exhibition Building there are one of the grooves, after which the broken ends PIDST TEST

Specimen.	Rectangular groove.	Curved.	V-shaped.
No. 1 No. 2 No. 3	56,021 54,606	****	55,738
	SECOND TEST.		
Specimen.	Rectangular groove.	Curved.	V-shaped.
No. 1 No. 2 No. 3	61,114		61,679 59,982
	THIRD TEST.		
Specimen	Rectangular groove.	Curved.	V-shaped
No. 1 No. 2 No. 3	****	67,621 66,772 67,055	

These experiments were very carefully and impartially made, and would seem to establish doubt.

I must say, however, in view of my expe rience in testing fron, that I should be unwilling to base any very decided opinion upon so lim ited a number of experiments, and will explain that we were only prevented by pressure of other business from making them more com

It is well known that long bars will not stand so great a tensile strain as short specimens, and the reason is not obscure, as there is probably no iron absolutely homogeneous, and a bar is of course no stronger, as a whole, than its weakest section. In cutting out a test piece, the probabilities are very much against encoun tering that weakest section.

Some of your readers may have fuller data which they can communicate on these subjects. C. SEYMOUR DUTTON.

WOLCOTT, N. Y., June 17, 1876.

In connection with the above, our readers will be interested in the following article, which we take from The Hul, giving the results of comparative tests of Low Moor, Burden's best and Henderson's patent irons, recently made in this city:

"Comparative tests, transverse and tensile have recently been made in this city, at the School of Mines, Columbia College, with Low Moor, Burden's best and Henderson's paten irons, under the direction of Professor Roberts C. E. and E. M. Mr. Harrison, of Newark, N J., and Mr. J. L. H. Mosier, of this city, were present at these trials, and the latter has kindly furnished us with the following details of the results obtained :

| MTM | | MMM |

	Size of Subject.	Length of Subject.	Strain at Starting	ain at Strain per rting. Sq. In.	Strain at Fracture	Strain per Sq. In.	Elonga-	ga- Reduct'n of Area.
Low Moor Burden's Best	Inch sq.	Inches, 29 29	Lbs 16,000 16,000	Lbs. 32,000 32,000 32,000	Lbs. 24,740 27,050 30,500		Lbs. 49,480 54,100 61,000	Lbs. Inch. 19,480 1% 14,100 1% 1%
			TRANSYR	TRANSFERSE STRAIN	N.			de amont to constitute to an adjust
	Length.	Size.	Suspen-	Strain at Starting.	strain per	CID .	Showing	Strain Defice- howing tion.
Low Moor Rurden Henderson	Inches. 12 13 13	Inch.	Inches. 10 10 10	Lbs. 700 1,000 1,000	Lbs. 1,400 2,000 2,000	26 1	Lbs. Vot taken 3,000 3 800	Lbs. Inch. ot taken Not taken 3,000 %
		Doduc			Traffor			Practue.
	Strain.	tion.	Set.	Strain.	tion.		Set.	Set. Strain. Strain pe
Low MeorBurden	Lbs. Not taken No 4.200 5,000	inch. t taker 6-64 53-64	Inch. Not taken 4-64 5-64	Lbs. n Not taken No 5,790 6,000	Inch. t take 53-64	2	Inch. ot taken 44-64	Inch. Lbs. Lbs. Not taken 6,100 12,3; % No fracture.

"The test of Henderson's iron was discon tinued after reaching 12,000 pounds per square inch with no signs of fracture. In the Low Moor test, there were seven fractures at 1% inch deflection, varying from three-sixteenths inch to half inch in depth. In the Burden test, there were six perceptible fractures, varying from one eighth inch to three-eighth inch. Low Moor was affected by granulation about 50 per cent., Burden's best about 25 per cent., while Henderson's presented the least possible

traces of grapulation on the tensile fracture. "The most important test, and the one which will most interest carriage builders, was the transverse test of carbonized subjects, which I also transmit the result of some experiments were 12 inches long, seven-eighths inch square made by Mr. Uber and myself, bearing upon a at 10 inches suspension, the results of which

Low Moor Burden Henderson		Low Moor Burden Hend-rson		Low Moor Burden Henderson	
7,390 7,390 9,000	Strain.	Lbs. 5,100 5,000	Strain.		
Inch. :85	Deflection.	Inch. 116 177 109	Deflection.	Lbs. 1,000 1,000	Strain at Starting.
Inch. -85	Set.	Inch. 108 107 None.	Set.	Lbs. 1,125 1,125 1,125	Strain per Square Inch.
Lbs. 7,100 7,330 9, 6 00	Bending Strain.	Lbs. 7,000 7,000	Strain.	Lbs. 4,000 4,200 4,100	Stram.
Lbs. 8,055 8,246 10,800	Strain per Square Inch.	Not taken. N '54	Deflection.	Inch. 14 -08 -07	Deflection.
Six. One.	Fractures in Number.	Inch. b. Not taken. '51 '08	Set.	Inch. .04 .04 .Wone.	Set.

fracture occurred as a gentle vielding, while with the Henderson iron it was a sudden frac ture and without warning, as occurs in breaking a bar of fine steel. The Henderson, at a there a gift or a bequest, until in this present strain of 9500 pounds, under the magnifier day it recalls in many features the Green Vaults showed no signs of fracture. The carbon had penetrated the Low Moor about '05 inch, Bur- It was the first to realize the fact that for den's about '07 inch, and in the Henderson iron the dividing line between the carbonized and normal iron was barely perceptible, so finely the sewing machine, or the telegraph, and the were the colors of bright gray (carbonized) and cold gray (normal iron) blended.

"If these tests and tables are correct-and we believe that they are-we then have two grades of American iron, made from American ores, which show themselves superior in the test to the celebrated English Low Moor iron, and all that is now required to conclude the controversy is practical test at the forge, which, if agreeing with the above, must clearly show that "Burden's Best " and "Henderson's Patent Iron are the best to employ in the construction of carriages.

"The Tomlinson Spring Company, of Newark, N. J., at whose suggestion the above tests were made, deserves much credit, their object being to ascertain the comparative fitness of the three kinds of iron above named for making carriage axles, and the result must be equally interesting to all axle or carriage makers.

"The tests were made on a Fairbanks machine, so finely constructed that each pound of pressure was duly indicated, and, to avoid any nnfairness, the irons were marked 'A,' 'B,' 'C." and it was not until the tests were completed that the parties engaged were aware of the grades of iron with which they had been experimenting.

The Origin and Progress of Industrial Exhibitions.

BY HUGH W. SWENY. (Continued.)

Without dwelling too long on details, it may be well before passing on to halt for a few moments and let facts and figures tell their own story of success. The building covered over 20 acres, its length in feet corresponded with the year of its erection, being 1851; it cost £193,168. 10/2-the twopence is a triumph of financiering-it was open 5 months and 15 days; it produced £506,100. 6/11; the surplus, an exhibition alone that never has flowered since, was about £186,000; the total number of visitors was 6,039,195, and the total receipts, both at the door and from season tickets, amounted to no less than £423,792. 4/7.

The aggregate number of exhibitors was 13,937, of whom Great Britain contributed 6861 the Colonies, 520, and the rest of the world. 6556. Persia furnished 12; China, 30; Greece, 36, and Denmark, 39, to this array, a remarkable contrast to their muster roll in subsequent exbibitions. The estimated value of the contents was £1,781,929. 11/4, of which the proportion set down to Great Britain and her Colonies amounted to no less than £1,111,508. 19/9, exclusive of the priceless spoil of the "old Lion of the Punjaub," the historic and match-less Koh-i-noor.

mela "Richardson, the great Dean; witty whose merchants once made the proud bosst, Sterne; Oliver Goldsmith (he needs no pet You can want no more, I'll swear,

The awards consisted of the Council Medal, ranking with a diploma of honor, the Prize Medal, and a Certificate of Honorable Mention, distributed as follows: Council medals, 171: prize medals, 2954; and honorable mentions

The glass and iron mode of construction has since made the circuit of the globe; New York in 1853, the "second edition," revised and imborough, Sir Joshua, Watts, all of whom, proved, at Sydenham in 1854, the miniature copy at Melbourne, and the Glas Palast at lieve the monotonous mediocrity of a stupid Munich in the same year, the Dublin exhibition of 1865, the Paleis Van Volksviyt at Amsterquarter of a century has suggested no more anent great Twaimy and his patent iron, "no fitting materials than iron and glass for the Industrial Building of 1876.

But the great exhibition did not alone endure in its prototypes or in a series of world's fairs; all these are but a means to an end; its truest monument is to be found in its offspring, South Kensington Museum and its compeers; by their means the blossoms of one display have become the fruits of the next; the taste for the beautiful, by their example, has been spread broadcast all over the earth, and art has become the ally and not the antagonist of industry.

Not this alone, but in the words of the princely founder, we begin at length to realize ner, Wilkie, Wellington, Nelson, the Napiers, how much the world is a gainer "by peace, love the Lawrences, Havelock, who "dead atial and ready assistance, not only between indivi- keeps the realm he saved;" Outram the Bayard duals, but between the nations of the earth," of India, the engineers Brunel, father and son; numbered no less than 54,936, for a provincial

end to which all history points, the realization in diverse ways and by different means, have characteristics of the different nations of the earth, but rather a unity, the result and product of those very national varieties and antagonistic qualities.

South Kensington Museum may be regarded as an A B C of art (the number of visitors from its beginning show at the present day an aggregate of nearly 15,000,000), barely tolerated at first, laughed at by those who regard every innovation with the same eyes as Hollanders look on an incipient fissure in a dyke, and possibly for a similar reason, as the tide of popular feeling has gradually opened up the chink it had made in the dam of ignorance, and now the waves of art culture have spread over and fertilized the land. It was said, look at your buildings, is that your boasted taste? and indeed the "Brompton Boilers" were but a rude Lusk for so sweet a kernal, but, as the proverb says, "Rome was not built in a day," so it required time for the truth to triumph; now the asket is worthy of the gems, and of no institution in our land are Englishmen more proud than of our great Art Museum. It was the schoolmaster at home; it taught the masses through their eyes, its nucleus consisting of gifts and purchases to the extent of £9000 from the exhibition of 1851, bit by bit it was built up, treasure by treasure it was added to, no large sums were voted for it; here was a purchase, of Dresden or the Imperial Treasury of Vienna. women there were other occupations than the needle, whether that of the little steel stiletto,

the "Quatre Bras" of Miss Thempson, dispersers, the hammer of the auctioneer has been as fatal in its effects as that of the iconoclast; the sale of a week has dispersed the accumulation of a lifetime, or under every favorable circumstance the besom of the housemaid has been frequently as destructive as the play-ful gambols of "the domestic cat" or the fire caused by the melting pot of the plumber. All that is now, humanly speaking, a thing of the past; treasures of bygone art are massed together, not to be separated again until an invader finds London "a pleasant city to sack," while still more has been effected, the fact that the millions appreciate their property has moved the possessors of stored up artistic wealth liberally to contribute of their abundance, and thus make the beggar wealthy as the king, for both can but enjoy.

Loan collections have become an institution. that of 1862 was a rival even to its mighty neighbor, with such relies as the distaff of Marie Stuart, the mitre of a Beckett, and the cap of good, brave Sir Thomas More. Since then history has been taught more effectively by the loan collection of historical portraits in 1866, '67 and '68 than by a course of Hume and Smollett washed down by Macaulay. In the first year were shown portraits from the earliest periods to 1688, many as apocryphal as the Gallery of Kiugs at Holyrood, but including such genuine works as the Chandos and Lumley Shakespeares, and Hlustrating thoroughly the great (great in its literature) Elizabethan age. A minor poet has chronicled this exhibition well in some verses, two of which run thus :

Great Eliza had a fancy for being painted very often, With her silk brocaded dresses, stuffs and jewels

passing rare, But though Spenser praised her beauty, not all Hol-bein's skill could soften The dark frown upon her features, and her concen-trated stare.

Then there's winsome Marie Stuart, and though some say stain of sinning Cast its shadow on the fairest flow'ret that the White Rose gave to earth, would hold my youth's allegiance and believe that one so winning
Was as pure as she was noble, and as gentle as her birth.

The second carried one on from our Revolution through "the tea-cup days of hood and hoop, and, when the patch was worn," through bespattered Bolingbroke; gentle Dickey Steele; Pope, that note of interrogation, crooked in mind as in body ; kindly Addison : lazy Thomepithet); Burke who roused the nations and sent the Commons to sleep; Sheridan, wit, statesman, orator and dramatist; Burns, plow man, poet and patriot; Chatham, Charles James Fox, "the divine William" of his friends and bottomless Pitt' of his enemies; Curran, Grattan, Wilberforce, whose fame survived children of the eighteenth century, serve to reand inglorious era. The third exhibition, in 1868, took up "the story of our island song" age so great and no times so important as ours," there is little doubt that this our nineteenth century will come forth triumphantly from the so bold as to deny that Byron, Coleridge (whose name yet survives in writs as well as writings. and whose successors go far to disprove the old theory that brains do not descend), Brougham, Canning, noble sire of noble son; Scott, Keats, Southey, Tom Moore, Shelley, Hood, Campbell, Macaulay, Rogers; the pen-Hogarth of our day, Charles Dickens; Thackeray; the kindly-hearted satirst, Jerrold; Turand slowly but surely draw near to "that great the Stephensons, Wedgwood and others who, display it must be pronounced a success.

of the unity of mankind. Not a unity which all striven to exait our age, will survive as breaks down the limits, and levels the peculiar names of power, whose fame the English speaking world will not willingly forget. Nor was this allowed to be the mere sensation of a season, but, calling the attention of the nation to a national want, lent considerable aid to the permanent Valhalla of our worthies, the national portrait gallery.

Later on the public, both traveled and untraveled, have learned as much from the Meyrick Collection, as it could have from the Zwinger at Dresden, or the Ambras Gallery in the Lower Belvedere. 1872 saw three notable collections; the varied and cosmopolitan treasures of the Duke of Edinburgh, where the modern gold and silver work of Australia, the bronzes and lacquers of Japan, the "Kooftgarl" work of India, the "Kahilis" or Royal Standards of the Sandwich Islands, and the porcelain of the Flowery Land, egg shell, rackle, turquoise, sang-de-bæuf and clair de lune all were massed together; the collection of musical instruments which ranged from the organ tiger of Tippoo Saib to the spinet of Queen Elizabeth, and the monster bass viol of the Duke of Leinster; and finally the superb acumulation of jewelry.

In this last the art student could trace personal adornment down from the jewels of Queen Ashhept, the mother of King Ashmes, who founded the 18th dynasty eighteen hundred centuries before Christ, and was not only coeval with Abram and Sarai, but was the identical Pharaoh who was "plagued with great plagues because of Sarai, Abram's wife," and who was contemporary with the expulsion of the Shepherd Kings. On went the list through the cunning handicraft of the Greek and Etruscan periods, to the massive forms of old Rome and the delicate art of the gold workers of Taresults are everywhere apparent, in the porcelain of Minton, in the black and white designs of rentum, till it passed into the Cinque Cento, and the illustrated papers, in the "Roll Call" and on to the revival of Benvenuto Cellini and the tasteless garnishness of the age of Rococco. Every age has had its collectors, but also its Here too were historical tokens, such as the lispersers, the hammer of the auctioneer has Darnley jewel, made about 1576 for the Lady Mary Douglas in memory of her husband, Regent of Scotland; a reliquary of Catherine of Braganza: a pendant of another Queen and Catherine yclept Parr; the sapphire ring thrown from the window by Lady Scrope, that was borne northward by relays of horses as fast as the beacon flash that told of the coming of the Armada, and that welcomed the first of the Stuarts to the throne of the last of the Tudors the gift to his Queen from the lion hearted Drake, and the missal cover of Henrietta Maria, unhappy daughter of an unhappy sire, Henri Quartre, a more unhappy mother, Marie de' Medicis, and wife and widow of a most unhappy king. 1878 saw a collection of needlework, rich in

art and historical interest; copes, chasubles, stoles and maniples, the pall of Sir William Walworth, the baby linen basket wrought by his mother for James the First, and the baby linen, never needed, worked by Elizabeth for her sister Mary. Then later the offshoot of South Kensington, Bethnal Green, laid open to the teeming masses of London an art academy for the million in the unrivalled cloisonnerie, the bronzes and the masterpieces of Rembrandt, Van Dyck, Greuze and Meissonier lent by the liberal minded Sir Richard Wal-But South Kensington has done still more; at home not only has it put life into the dry bones of fossil art schools, and established flourishing schools of design in all our centers of industry, but abroad it has set the example followed in every country that pretends to civilization, and thus is in truth the ancestor of all the art industry museums of the world. To sum them up briefly, it is sufficient to name the Conservatory of Arts and Trades at Paris, the Museum of Industry at Brussels, the Museum of Art and Industry on the Stuben Ring at Vienna, with its treasury of the King of Hanover, the Magyar Ipar Museum at Buda-Pest, the Art and Industry School of Carlsbad, the Museum of the Minister of Commerce for Schools of Art in Austria; the Brunn, Lemberg, Cracow and Reichenburg museums, for Moravia, Galicia, Poland and Bohemia respectively.

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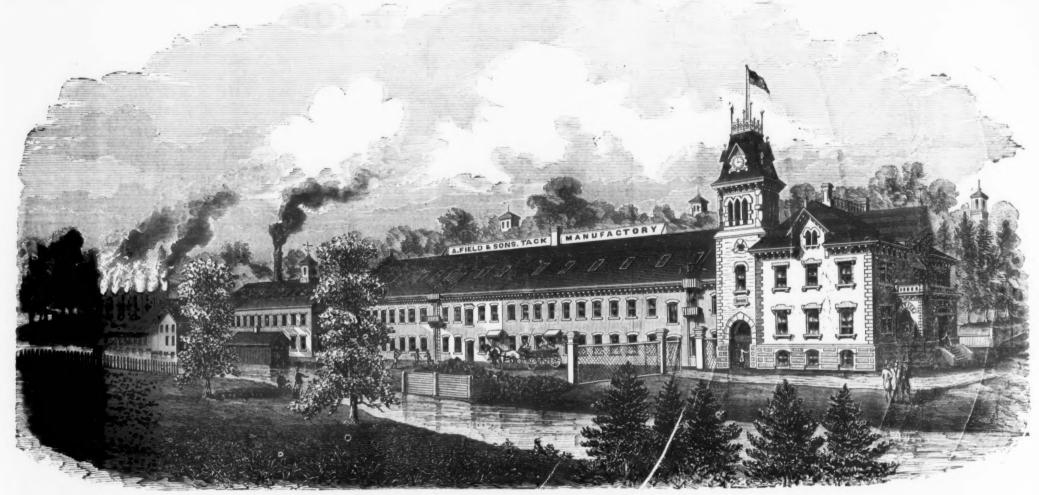
Then come the museums of Berlin, Konigs berg, Nurnberg, Munich, Carlsruhe, Cassel, Hanover, Hanau, Hamburg, Leipsic, Stuttgart, son; burly Johnson; gossiping Boswell; "Pa- Darmstadt, and that of quaint old Lubeck,

You can want no more, I'll swear, Than the honor of a Lubecker.

Running through the list we find "Auld Reekle'' with its museum, rich in Icelandic art lore, Keltic, Danish and Gothic relics, Stockbolm, Milan, Turin and Florence, St. Petersburgh, Moscow and Helsingfors; and across the Atlantic, the Massachusetts Museum of Fine Arts in appreciative Boston. Even Turkey has its School of Industry at Constantinople, whilst Yedo has inaugurated a museum which only needs that Japanese works of by-gone days should be gathered together to make it an art bourne for the art workmen of the West. dam in 1869, were all modifications of the great example of 1851, while the experience of a laugh with "gentic Goldy," and say with him these caks; it set the primal example, and to the world's fair of '51 it owes existence. and to its founder the world owes a debt beyond all monument. As for the benefits that the art industry of every country have derived unimpassioned criticism of future times, who from these several museums, they are patent, and manufacturers everywhere agree that for the future in the marts of the world commerce must go hand in hand with taste.

In 1852 came a lull after a tempest of success. and, as "when a well-graced actor leaves the scene, the eye but idly follows him that enters next." so the Cork Exhibition, held in the Corn Exchange, by "the pleasant waters of the River Lee," did not receive the full meed of merit it undoubtedly deserved. Still, as the daily admissions marked the number of 74,095 in the total, and the admissions by season tickets

ESTABLISHED 1827.



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The "Summer Queen" Petroleum Cook Stove.

We show in the accompanying illustrations a simple, practical and safe cook stove for burning petroleum oil. The discomforts of a hot coal fire in summer cannot well be described, and these are aggravated by the fact that, once kindled, it cannot be extinguished until it has







burned out and cooled down slowly. The gas stove, though somewhat costly to use, meets the requirements of a summer cooking apparatus in houses supplied with gas, especially where economy in the cost of fuel is not an important consideration; but an equally practical and vastly more economical substitute for coal is found in petroleum when burned under conditions favorable to complete combustion. The petroleum flame can be lighted in a moment; will do all that can be done over one hole of a cook stove: makes no dust or sakes; can

burned out and cooled down slowly. The gas stove, though somewhat costly to use, meets the requirements of a summer cooking apparatus in houses supplied with gas, especially where economy in the cost of fuel is not an important consideration; but an equally practical and vastly more economical substitute for coal is found in petroleum when burned under conditions favorable to complete combustion. The petroleum flame can be lighted in a moment; will do all that can be done over one hole of a cook stove; makes no dust or ashes; can be placed where it will be least in the way, and when not needed, can be extinguished at once. Among stoves of this kind the Summer Queen possesses many conspicuous advantages. It is odorless, and makes neither smoke nor smell; it is so simple that the least intelligent servant can manage it with success; it is strong and durable, and cannot be injured by long continued good usage; it costs less than one cent per hour when in use, and will do everything which can be done with a coal or wood stove of equal surface. It is, moreover, absolutely safe. The wick tubes are surrounded with water, and the oil reservoir never approaches a temperature at which explosive gases are generated.

In our illustrations, Fig. 1 represents the stove with the top thrown back, ready for lighting. The lower reservoir is filled with oil, and the upper is half filled with water. Fig. 2 represents the stove with kettle. A gallon of water will boil in 16 minutes from the time the oil is lighted. Fig. 3 shows the stove with flat iron heater attached. By this simple device three irons are heated at once. These stoves are provided with capacious ovens, capable of roasting and baking as well as in a cook stove oven. Among the articles of necessary furniture is a broiler of excellent construction, which will broil a steak as well as in a cook stove come in four sizes. It is an article which, we are satisfied, meets a want, and which can be recommended to the trade as a seasonable novelty.

Bursting of a Water Tank in an English Hospital.

The Engineer (London), of recent date, gives the following account of a curious accident:
A large water tank on the top of St. George's Hospital gave way recently with very disastrous results. As a careful inquiry will be made by competent engineers into the circumstances of the case, we, for the present, reserve the exby competent eugineers into the circumstances of the case, we, for the present, reserve the expression of our own opinions on the subject, and content ourselves with the publication of an accurate statement of the facts. At the proper time we shall deal with the questions involved, which are of very considerable importance. The tank which gave way was erected in 1869. It was 10 ft. square in horizontal section, and 12 ft. 6 in deep; when full, it held 7500 gallons, and at the time of the accident it was being filled, but was said to be 4 ft. less than full, containing about 5000 gallons, or, in round numbers, 23 tons of water. It was constructed of cast iron plates, 3 ft. square, with machine-planed edges and internal flanges, secured by bolts and nuits, the corner pieces being rounded to a 6 in. radius. It was stayed with direct stays across the tank, between the flanges on opposite sides, and was supported on wrought iron girders, at about 8 ft. above a lead, flat on the top of the hospital. It was supplied with water from an artesian well at the nospital. On Saturday morning, at about eleven o'clock, water was seen to be coming through the ceiling of one of the wards under the tank. The superintendent, Mr. Todd, and the engineer employed to attend to the boilers and mechanical apparatus in the hospital, immediately proceeded to the roof, and observed a jegged crark on the eastern side of the tank, from which water was flowing freely. Without a moment's delay the engineer proceeded to draw the waste plug, but he had scarcely accomplished this before the crack suddenly extended, gaped open, and the two lowest tiers of plates of the castern side of the tank blew out with twenty-three tons of water behind them, fell on to and passed through the roof, 3 ft. or 4 ft. below the tank bottom, then, gaining velocity, the combined mass of tank plates and water and debris, swept downwards into the student's room on the ground floor. Two patients were carried down from the upper and three from the lower ward by the catar the case, we, for the present, reserve the ex-ssion of our own opinions on the subject, and

Fig. 3.

Special Notices.

The undersigned, being directed by the Chancellor of New Jersey to offer for sale the vessel known as the Stevens Battery and the material thereto belonging, now lying at Hoboken, New Jersey, would hereby invite proposals for the purchase of said vessel, to be addressed, Stevens Battery, Office of the the Hoboken Land and Improvement Co., Hoboken, N. J., and to be delivered at the said office on or before noon of July 17th, reserving the right to reject any or all bids if not deemed advantageous, and the acceptance of any bid being subject to the approval of the Chancellor. The terms of sale will be, one-quarter cash and the balance upon the resnoval of the vessel; subject to the approval of the Chancellor. The vessel will be open to the inspection of bidders, and farither information will be given upon inquiry of Prof. R. H. Thurston, of the Stevens Institute, or at the office of the Hoboken Land and Improvement Co., No. 3 Newark St., Hoboken, N. J. Bidders can receive at said office information as to the terms upon which the land and shops adjoining the Battery can be leased for the term of one year.

Signed,

FITZ JOHN PORTER,

BENJ. G. CLARK,

W. W. SHIPPEN sel, to be addressed, Stevens Battery, Office of the of one year.
FITZ JOHN PORTER,
BENJ. G. CLARK,
W. W. SHIPPEN,
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IN ADDITION to Auger Bits, I make a full line of Extension Lip, Car, Machine, Dowel and Hand Rail Bits, also of Boring Machine, Carpenters' and Milwrights Augers. All my goods are solid CAST STEEL, and perfectly made by means of my Patent Machinery.

SPECIAL NOTICE.

the extent of the law. Russell Jennings. Deep River, Conn., Sept. 7, 1874.

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The under-signed has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of Macairist's Tools as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of DATIO W. Pond, Successor to Lucius W. Pond. CARD.—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Worsmanship, and quality of Machinery shall be maintained. A large quantity of New AND SECOND-HAND TOOLS, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand toous. Store at 98 Liberty St., New York, will be discontinued from Feb. I, 1876, and all sales made from manufactory.

Respectfully, DAVID W. POND,

Respectfully, DAVID W. POND.

DISSOLUTION OF COPARTNERSHIP

The firm of McClernan & Hymes is this day dis-solved by mu'ual consent. The business of the firm will be liquidated by M. McClernan alone, No. 130 Liberty Sirect.

New YORE, Jac. 20, 1876. M. McCLERNAN, D. HYMES.

Special Notices.

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Want to extend business and increase the present capital \$20,000. None but first-class business men with experience, energy and capital need apply.

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Wanted,

By a practical man, a situation as manager over rolling mills. Has had many years' experience both as workman and manager, in some of the most eminent firms in England. Understands thoroughly the ment firms in Legizad. Understands theroughly the manufacture of all kinds of iron and steel, viz: boiler plate, rails, hoops, merchant iron, armor plate, Bessemer and puddled steel. First-class cirtificates as to ability, etc., can be shown. Refers to Mr. ?; Gill, head superintendent at Hopkins, Gilkes & Co.'s, Middlesbor-on-Tees, England; and to W. H. Brown, Neepend, Sheffield, England.

Richard Jones, Care Foxell & Jones, Troy, N. Y. Office of Pope, Williams & Co., { Chateaugay Lake, May 1st, 1876. }

We have placed the exclusive sale of our CHATEAUGAY STEEL IRON in the hands of Messrs. Naylor & Co., 99 John St New York: 208 South 4th St., Philadelphia: 6 Oliver St., Boston, who will hereafter act as our agents, and to whom all orders should be addressed.

Yours, truly, POPE, WILLIAMS & CO.

WANTED.—A situation by a practical double entry Book-keeper. Would prefer a Rolling Mill, having had several years experience in that business. References satisfactory. Address J. R., P. O. Box 45, Battimore, Md.

CENTENNIAL EXHIBITION.

A young man, a native of this city, with good references, having had large experience in the Hardware Trade, offers his services in receiving, arranging and keeping goods in order during the exhibition. Terms moderate. Address,

461 North 2nd Street, Philadelphia I have three patents for Dies, Machiners, and Tools for making Augers and Bits, each running seventeen, years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. There is a special cloim on each of the Dies. All persons integringing on said patents will be held responsible to WANTED TO PURCHASE, Rails, 18 or 20 lbs. per yard.

Address, giving particulars, PIPER & THOMPSON. Lapeer, Mich.

A. PURVES & SON. Corner South & Penn Streets, Phila.,

Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Habbit Metals, Foundry Facings. Best Quality Ingot Bras Cash paid for allkinds of Metals and Tools.

HALL & HARBESON.

Chemical & Physical Instruments, 191 Greenwich Street, N. Y. SPECIALTY.—BUNSEN'S LIBEROVED GAS COMBUSTI.M FURNACES, WITH 01.13 and 25 DURNERS, Fine Brass and Metal Work made to order for Metallurgists, Chemists, Experimenters, Colleges. &c.

SITUATION WANTED by a young (married) man. Has had eight years' experience, five with a city hardware and cutlery house as traveling salesman. A 1 reference. Address Salesman, Office of The Iron Age, 10 Warren St., N. Y.

VENTILATING & STEAM HEATING. A thoroughly competent engineer, with extensive

experience in the above line, desires employment.

Address

Office of The Iron Age, 10 Warren St., N. Y.

WANTED situation as foreman in a mechanical establishment, by a man 28 years of age. Is a college graduate, has served a three years' apperenticeship at machinists' trade, and for past two years has been assistant draughteman in water works construction. References as to ability and character. Address, F.M.C., P.O. Box 268, Rochester, N.Y.

Special Notices.

ROOFS.

Save time and money by sending for estimate for new or old buildings. Send for our 100 page Book (free if you write to-day), and learn how to stop leaks effectually and cheaply, save re-shingling, etc. Correspondence invited. S Cedar St., N. Y., or 49 S. Front St., Phila. Mention The Iron Age.

JUST ISSUED.

EVERYTHING Seeds, Implements, Macbinery, and Fertilizers.
New Catalogue, 200 Illustrations, mailed on re-

FARM. A. B. COHU,
197 WATER ST., N. Y

Important to Manufacturers. BISSELL, WELLES & MILLET,

Auctioneers and Commission Merchants, No. 15 Marray St., New York, 15 Murray St., New York,
Solicit from Manufacturers and o.hers consignments of Hardware and Cuttery for our weekly
Auction Sales to the Trade, or at private sale for
cash, as desired. Our facilities for moving large lines
of goods are unsurpassed. Advances made if desired.

Wanted,

A Foreman who has had practical experience in the construction of Architectural Iron Work; must understand draughting and figuring quantities. A per

manent situation for a good steady man.
Address H. W. BELDIN,
195 Reed St., Milwaukee, Wis., giving terms and referen

Wanted.

None but a practical hardware man need apply, and the best of reference must be given.

S. L. McKISSON, Address

Des Moines, Iowa WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,

n. References satisfactory.

IRON AND STEEL, Care of P. O. Box 813, Bridgeport, Conn.

DROP FORGINGS.

The TRENTON VISE & Tool Works, Trenton, 7. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings n quantities to order at reasonable rate HERMANN BOKER & CO., Proprietor 101 & 103 Duane St., N.

S. B. LOWE,

Unattanooga, Tenn.

Dealer in METALS AND OBES. Special rates of freight to all principal points in the United States and Canadas.

TO LET,

A Light, Handsome Office.

Possession Immediately. HERMANN BOKER & CO., 101 Dunne Street. N. Y.

HARDWARE.

FOR SALE in the best business part of Jersey City, a first-class Tool and Hardware business Established about 25 years, and doing a fair business Apply to H. LUTTGEN.

57 Montgomery S., Jersey City.

MANUFACTURERS

us of introducing their goods to the British and Continental Markets, are advised to insert dvertisements in the newspaper 66 IRON, 99 pub lished every Saturday, at 99 Connon Street,

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

Steel Castings.

CHESTER STEEL CASTINGS CO., Evelina St., Philadelphia, Pa.

Wanted-A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

P. O. Box 134, Selma, Alabama

Briesen's Patent Agency FOR SECURING INVENTIONS, TRADE

MARKS, &c., IN AMERICA AND EUROPE,

No. 258 Broadway, New York. A. V. BRIESEN.

A FTER SEVERAL YEARS OF SUCCESSFUL experience in the construction of

New and Experimental Machinery, we desire to invite the attention of manufacturers and others wanting that class of work, to our facilities at Peckskill, N. Y., near the Hudson River Railroad depot, 1h. 20m. from N. Y. City

ANDERSON BROTHERS.

for Sale, &c.

For Sale.

No. 3, Fowler Punch and Shears with large assortment of dies and punches—cost \$800. Price, good order, \$325. Heavy iron Shears, capable of cutting 3 in. square iron-cost \$900. Price \$400.

s, c. forsaith & co., Manchester, N. H.

For Sale.

Magnetic Iron Ore For Sale.

1000 tons; contains about 60 per cent. tron; is suitable for making Bessemer steel; makes a fibrous iron; mill cinder may be worked with it to advantage. Delivery at any point on Lakes Ontario or Eric. Apply J. M. MACHAR,

Kingston, Ontario, Canada.
See specimens from Machar Mine at Centennial.

For Sale Low. Wire Straightener and Cutter.

This machine is nearly new, having been used but a few times. Connected with it is a machine for making hair pins. The whole will be sold for less than haif its cost. Apply to or address Watson & Kelso, 46 & 48 N. Front St., Philadelphia.

FOR SALE, at Taunton, Mass. The Steam Engine Works known as the Foundry and Machine Co., consisting of all the Real Estate, Machinery, Tools and Patterns nece-sary for building Corliss Steam Engines, from 10 inch to 34 inch gine Groniss Steam Engines, from 10 inch to 34 inch gine ergonal job work. This property will be sold extremely low, either for the Machinery, Tools and Patterns to be removed, or the entire property. The city of Tauntos offers superior advantages as a location for any kind of machine business, having a navagable river for receiving coal and from. Two lines of railroad connected by steamers between New York and Boeton; superior Western connection by railroad, and a large and intelligent manufacturing population. For further particulars or catalogue of machinery address

GEORGE A. FIELD, Taunton, Mass.
Or J. M. LEONARD, Somerset, Mass.

Screw Factory For Sale.

By order of the Bondholders of the International Screw Nail Company, of New York City, there will be sold at Public Auction, Thursday, July 27th, 1876, A man to keep a set of books and clerk in hard-ware store, or would sell a half or whole of stock. Bay State Village, in the town of Northampton, Mass., the following property to wit.: All that tract of land containing about twelve acres, formerly owned and occupied by the said International Screw Nail Company, together with the buildings thereon, consisting of a brick mill 150x40 ft., three stories high and basement, and six dwelling bouses; water privilege of about 60 horse-power, steam boiler and piping for heating the mill, and also the full equip-ment appertaining to said screw factory for the production of 1800 gross of screws per day, viz.: Headers, Shavers and Nickers, Threaders, Patterns, Shafting, Belting, Machine Tools, Office Furniture, Fixtures, Patent Rights, &c., &c. For catalogues, apply to

W. T. CLEMENT, Esq.,

Northampton, Mass. FOR SALE.

An % inch mill train for making Merchaut, Band and Hoop Iron. Will be sold cheap.

W. W. JONES. Apply to

Near the Lehigh Valley Railroad Depot, Allentown, Pa.

PATENT FOR SALE.

The Swiss Industrial Co., of Neuhausen, Switzer-land, have invented an apparatus for heating and ventilating RI. Rd. Passenger Cars, and offer their patent, dated May 26, 1876, For Sale. Apply to

Mr. A. W. MANNEL, 88 Prince Street, N. Y.

FOR SALE.

TESTING MACHINE, built by the Son of Boston Iron Co., arranged for tensile and compressive strains, capacity 180 tons.

MILLING MACHINE, built by Brainard Milling Machine Co., cutters swing 28 inches diameter, and spindle set at right angles, which insures accurate work

IRON ROOF, that coveren New England Iron Co.'s Mill, 8 arches 80 feet span, posts 18 feet high, building now 80 feet wide by 90 feet long.

ROLLING TABLE, for straightening Iron.

PUDBLE TRAIN, for Billets and 3, 4 and 6 inch Bars.

inch Bars.
FIVE DRILLS,
CORRUGATING MACHINE, Complete.
CORRUGATED SHEET IRON and barbed

SMALL UPRIGHT ENGINE, 15 H. P.,

Apply to WM. E. COFFIN & CO., 8 Oliver Street, Boston. **V**aluable Furnace Property and Mineral Lands FOR SALE.

The assigness of McKNIGHT, PORTER & Co. will offer at Public Sale, at Monticello Farnace, Cowanshannock Station. Allegheny Valley Railrond, On Wednesday, July 19, 1876, at 10 o'clock A. M., that valuable property known as the

MONTICELLO FURNACE, consisting of about three hundred acres of land, on which is erected a blast furnace, with all necessary buildings. Coal and ore banks contiguous.

Also about one thousand acrets or valuable land, underlaid with coal, from ore and limestone. This land is on opposite side of river from furnace.

The furnace has been in blast within six months, and everything is in order for immediate operation.

For any further information, address,

EDWIN MILES and JOHN W. WILEY. Assignees, Pittsburgh, Pa., who will forward circular giving detailed description of property. E. MILES, J. W. WILEY, Assignees.



at 10c. a copy, Weekly Spanish Review and Prices Current. The undersigned is also a Translator from and into the English, Spanish, French and German. Latest Translations mode: for the governments of Germany and Spain, Pacific Mail S. S. Co., Walter A. Wood; Morris, Wheeler & Co.; Todd & Rafferty; John T. Dunkin; Fisk & Hatch; R. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marquardt; M. Scheverria & Co., and Chas. E. Little, New York: Hocking Valley Mig. Co.; W. P. Potts, Son & Co., Phila.; Atlantic and Pacific Land Co.; B. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), Abendroth & Root Mig. Co., to whom he relers.

To Estimates furnished of translations and setting up of Spanish, German and French Catalogues for the Centennial.

C. KIRCHHOFF, Metal Reporter of "The Iron Age,"

Bex 3091, New York P. 0.

Trade Report.

Office of The Iron Age,
Wednesday Evening, July 5, 1876. I
Owing to the holiday character of the past week, the financial markets have been very dull, and Wall street has presented an almost deserted appearance. The money market has manifested a tendency to increased firmness, owing to the preparations for the July interest and dividend disbursements. The rate on call loans increased to 21/2 @ 4 per cent. The discount on prime mercantile paper is 31/4 @ 5 per

The gold market has been somewhat firmer this week, and the premium has advanced to 112%. There is still an important "short" interest, and 1@2 per cent. is paid for carrying. The reasons for the advance are found in the threatening aspect of affairs in the East, the prospect of an increased specie export, the threatened repeal of the resumption act and other causes. Foreign exchange is strong. We give below the daily range of the premium since our last report :

Highes	t. Lowe
Thursday1123	11
Friday 119	
Saturday	
Monday	
Tuesday	
Wednesday112	% 11:

The bond market has been strong on the demands of investors, who are purchasing with the money disbursed in the July interest All classes of investment payments. securities have advanced, with a few exceptions. The demand for desirable first mort gage railroad bonds has exceeded the supply in the market. We give below the quotations of governments at the close of business to-day.

In the stock market there has been an unusually active speculation, beginning on Wednesday of last week. The large dealings have extended to nearly all the shares on the active list, and prices, as the rule, have advanced. We give below the quotations of active shares at the close of business to-day.

The following tables show the foreign trade movements for the week, so far as reported:

IMPORTS.

For the week ended July 1:

1874. 1875. 1876. Total for week... \$5,107,430 \$6,368,188 \$3,486,548 Prev. reported...211,153,581 176,747,313 153,498,947 Since Jan 1....\$216,261,011 \$183,115,531 \$156,985,495

Among the imports of general merchandise were articles valued as follows:

Brass goods	13 2,9
Bronzea	
Chains and anchors	4 10
Copper	2
Citiery	17 4,4
Gas Fixtures	1 6
Guns	
Iron, plg, tons	
Iron, sheet, tons	5 8
Iron tubes	686 1.0
Iron, other, tons	11 6
Lead, pigs	
Lead ashes	
Metal goods	
Nails	
Needles	
Old metal	
Platina	
Saddlery	
Steel	
Tip, boxes	
Tin, 2336 slabs	201.014 32.6
Tin, 2000 slaus	
WireZinc	
Zinc	109,130
EXPORTS OF SPECIA	E.

For the week ended July 1:

Total since Jan. 1, 1876 \$2,171,135

Same time in 1875	7,371,104
Same time in 1874	2,065,819
Same time in 1873	1,962,011
Same time in 1872	755, 131
Government bonds close as follows:	
Bid.	Asked.
U. S. Currency 6s	197
U. S. 6s 1881, reg 119%	120%
*U. S. 6s. 1881, con	120%
U. S. 5-20 1865, reg	116%
U. S. 5-90 1865, con	116%
U. S. 5-20 1865. new reg	117%

119% 119% 121% 121% 118% 118 119 118 117%

er ar art and an artist and artist are are	
The following were the closing qu	otations
of active shares :	
Of active anales .	
Bid.	Asked.
Atlantic & Pacific R. R. Preferred 234	216
Atlantic and Pacific Telegraph 18%	18%
Chicago & Northwestern 42%	43
" Pref 6636	66 %
Chicago, Rock Island and Pacific 10934	10936
Chic., Bur. & Quincy	115%
Col., Chic. & Ind. Cent	4
Clev , Col., Cin. and Indpls 44	45
Cleveland and Pittsburgh 98	98%
Chicago & Alton	108
Chicago and Alton Preferred 108	110
Consolidation Coal 39	, 40
Canton 821/	40
Del. Lack. and Western105	105%
Delaware & Hudson Canal 106	106%
Adams Express10936	110%
American Express 58%	59
United States Express	7436
Wells, Fargo & Co. Express 85	86
Erie 1416	14%
Harlem139%	141
Hannibal & St. Joseph	25
Illinois Central	9834
Kansas & Texas 816	9
Lake Shore 58%	59
Michigan Central	52
Morris & Essex 10134	101%
Milwankee & St. Paul 41%	41%
" Pref 71%	7134
Mariposa 836	936
14 Pref 93/2	10
New York Central10836	109
New Jersey Central 75%	72%
New Jersey Southern %	1
Ohio & Mississippi	17%
Pacific Mail 96%	2616
Panama	140
Pittsburgh & Fort Wayne101% Pacific of Missouri7	102%
	15
Quicksilver	22
Pref 18 St. L., Kan. City Northern 54 Pref 2834	6
is Prof 922	99%
Tol., Wabash & Western 2%	234
Union Pacific	64
Western Union Telegraph 71%	72
ii and a manage a surgential in it.	

GENERAL HARDWARE.

Owing to the long holiday, from Saturday afternoon, July 1st, until this morning, but little business has been transacted in Hardware circles since we last went to press. The manufacturers of Strap and T Hinges have not yet issued their circulars, but as far as we can learn these goods are firmly held by the makers at the advanced quotation noted last week.

The incidents connected with the failure of John Nazro & Co., of Mulwaukee, having excited considerable inquiry, we deem it advisable to state a few of the leading facts for the information of those interested. Mr. Nazro had always claimed to have abundant resources in his business, and his request for a ong extension made in Sep., 1875, was unexpected and unsatisfactory. lt was granted, however, and as a surplus of \$135,000 was shown no serious apprehension was entertained of his ability to meet his extended paper. The first notes of this extension matured in March, 1876, and to the surprise of the bolders received from Nazro & Co. to compromise of the higher grades. their whole debt at 331% cents on the dollar. A meeting of the New York creditors was called, and one of their number de puted to go to Milwaukee to inquire into the causes of such enormous deficit. The results of that mission not being satisfactory, the New York creditors resolved to get other creditors to unite with them in putting the estate into bankruptcy. This effort, although strongly opposed, was successful. Mr. Nezro applied at the same time for a deed of composition in bankruptcy, but not having the requisite number and amount of his creditors, his petition was denied. The New York creditors now felt themselves secure in the accomplishment of their plans, but Mr. Nazro having secured an adjournment of the vote for appointment of assignee went to Wheeling and Pittsburgh with letters of credit from his friends, and succeeded in buying up so many of the claims against him as to give him a clear working majority in the vote for assignee. As this was considered by the New York creditors as putting the management of affairs entirely beyond the control of the petitioners in bankruptcy, they gave up the contest and accepted the proposed compromise,

Foreign Hardware is without any special feature of interest. We have recrived the following circular which explains itself :

New York, June 29, 1876.
Some boastful American Screw Makers, proclaiming a scarcity of these goods (probably
from the insufflency of 150 per cent. protective
duty), the subscriber assures his customers he
has an assortment for sale at the following dis-

Flat Head Wood Screws Iron and Brass 55 Round "45 % Nettlefold Screw Hooks, Eyes, &c., 70&10 %

Special rates for orders for exportation.

Terms, cash within 30 days from date of invoice. Prices subject to changes of the market without notice. Yours, respectfully,

GEO. W. BRUCE, 1 Platt street.

At the meeting of the Stamped Ware Manufacturerers' Association, held in this city last week, the discount from the list of Common Stamped Tinware was changed from 10 to 15 per cent. The price of Deep Stamped Ware remains as before.

Graham & Hames have been appointed sole agents for Tucker's Alarm Money Drawers, and they carry a stock of these goods at their warehouse, No. 113 Chambers street.

The Russell & Erwin Manufacturing Company continue to quote Flat Head Iron Wood Screws at discount 621/4 per cent., terms cash. 30 days.

We have received the following circular:

New York Office of THE DOUGLASS MANUFACTURING Co., No. 62 Reads street, New York, July 1, 1876. NEW YORK, July 1, 1876. J
To the Hardware Trade: We respectfully offer
our reduced list of Cook's Cast Steel Augers
and Bits. Discounts remain unchanged.
THE DOUGLASS MANUFACTURING CO.

Cook's Cast Steel Carpenters' Augers. Inch..... 34 34 34 34 34 1 134 350 10:50 12:00 13:50 Inch... 1½ 1½ 1½ 1½ 1½ 1½ 1½ 2 \$15 00 16 50 18 00 19 50 21 00 22 50 24 00 Cook's Cast Steel Ring Augers.

Inch..... 34 36 36 36 37 1 11/6 13:00 14:50 Inch. 11/4 11/4 11/4 11/4 11/4 11/4 2 \$16:00 17:50 19:00 20:50 22:00 23:50 25:00 Cook's Cast Steel Auger Bits. 5 6 7 8 9 4:25 4:50 5:00 5:50 6:00 \$4.00

11 12 13 14 15 16 17-16 \$7 90 8 90 8 15 9 25 10 00 10 75 11 50 18 19 20 22 24 26 28-16 \$12-25 12-75 13-50 14-50 15-50 17-00 18-50

Assorted in Sets..... 21 qrs. 24 qrs. 33½ qrs. \$5:50 6:00 7:50 Sugar and Plug Bits, same list as Anger Bits.

Cook's Cast Steel Dowel Bits.

4 5 6 7 8 9 10-16
\$3.75 4.00 4.25 4.50 5.00 5.50 6.25

The Goodell Company, Antrim, N. H., have arranged with D. H. Whittemore, of Worcester, Mass., for the exclusive right to manufacture and sell the "Bay State Paring and Slicing Machine." This machine is presented this season with important improvements, and it is the intention of the Goodell Company to turn them out in a manner that will be entirely satisfactory to the trade. They are now in a position to furnish fruit preparing machines of all descriptions. We invite the attention of our readers to their advertisement of these goods

on page 16.
G. B. Walbridge & Co., illustrate in their advertisement on page 31, the goods of the Standard Open Way Valve Company, for which they have been appointed agents; they offer these goods to the trade at the following list, which is subject to discount 25 per cent.

Prics List of the Standard Open Way Valve—Compo-sition Steam and Water Valves. Disc with Frink Packing

The demand for Nails continues light and prices are unchanged. We quote as before 10d to 60d \$3.10 per keg net, with a discount of I0 cents per keg on large lots.

Among "Special Notices," on page 20, we print the advertisement of a sale by auction on Thursday, July 27, of the Screw factory of the International Screw Nail Company, located at Northampton, Mass., to which we invite atten-

Attention is also invited to the advertisement To Inventors and Manufacturers," regarding the 45th exhibition of the American Institute, which will be found on page 20,

We print below the revised price lists for Locks, Knobs, &c., issued under date of 1st inst. by Mallory, Wheeler & Co., The Russell & Erwin Mfg Co., The Branford Lock Works and The Norwalk Lock Co. As already noticed important reductions have been made in the list prices of the cheaper grades of Locks; the discount on the entire list has been changed to 35 per cent. dishonored, and a proposition was making an advance on the net prices

BRANFORD LOCK WORKS.

REVISED PRICES AND DISCOUNTS. Attach to our consecutive list of January 1st, 1876.

1st, 1876.
TERMS—Discount 35 per cent., net cash, on all goods, excepting Shutter, Drawer and Picture Knobs, discount of which will remain as heretofore—60 per cent. Two per cent. may be deducted from invoices if paid within 30

TAKE NOTICE.

Upright Rim Knub Locks, 4 and 4½ inches.

The Reversible for right or left hand doors, and the Cap off Reverse are same price.

Also the new numbers low-priced Mortise Locks, 3½ and 4 inches, as described on page 4 of this circular.

The Reversible and the Cap-off are same price.

THEHART, BLIVEN & MEAD MFG. Co.,

Agents,

18 & 20 Cliff streets, New York. Branford, Conn., July 1st, 1876.

	Old	Door .	Knobs.	Old	New
1475	7.00		0466 %	9.00	6.20
1466 1466⅓	7-95	4.75 6.00	0465	7:50	5°00 5°25
465%	7.00	3·25 4·50	0465	22·50 6·00	21.50 3.75
967	7·50 5·75	6.00			18.50
963½ 965	8.52	6.00 4.50	2076	14:50 16:50 19:50	13:50 15:50
96334	7.00	4.75	2074	19:50	9.50 11.50
962%	6.75	4.50	2073	18.50	17:50
96234	5.25		9070 9071 9072	13 50 15:50	12·50 14·50
96136	8.20	7.50			10 50
961 961¼	7:00	6:95	2000	14.00	13:50 8:50
960%	7.00	6.00	2065	10.50 12.50	9°50 11°50
960	0.00	4.20 4.22	9065	8:50	7.50 9.50
955 956	0.00	6.00 7.50	2063	19.00	18:00 21:00
951	7.50	6:5	2062	16.00	15.00
950	62.00	\$1.00 4.75	2060	15.00	13.00
831	19.00	18:00	2058 2059	10.00	9.00
829	14.00	18:00 15:00	0057	15:00	14.00
827 828	10.00 12.00	9.00 11.06	9055	11.00	10°00 12°00
826	18:0	17.00	2054	9.00	8.00
894	15°00 13°00	14°00 12°00	2052	12.00	18:00
822	11.00	10.00	2050 2051	8°00 10°00	7.00 9.00
820	7.50 9.00	6:50 8:00	9041	22.20	21.50
816 817	8.20 New	5.75	2039	16.20 19.20	15:50 18:50
815	New	4.25	2038	14.50	13.50
813 814	New 7'00	4·75 5·50	2036	10.50 12.50	9.50
812	7.50	6.00	2035	18.50	17:50
810	6.00 New	4.50 3.25	2033	40-80	12.50 14.50
809	14°00 12°00	13.00	2031	9.50	8.50
807	10.00	9.00	2030	8.00	7.00
805	8:00	5.20 7.00	2028	12.50 14.50	11:50
809	8.20	7.50	2027	10.50	9.50
800	10.00	9.00	2025	7.00 8.50	6.00 7.50
600	5.00	4 00	2020	22-00	21.00
58514	22.20	21.20 4.00	2018	16.00 19.00	15·00 18·00
584	19.50	18.50	2016	12.00 14.00	11.00
583	14.50 16.50	13.20 15.20	2015	10.00	9*00
589	12.20	11.20	2013	15.00 18.00	14.00 17.00
580½ · · · · 581 · · · ·	18.50 10.50	17:50 9:50	2012	13.00	12.00
578 580	15.50	14.50	2010	11.00	8.00
575	11.20 13.20	10 50 12 50	2009	7.50	6.50
579	8°00 9°50	8.50	2007	14.00	13.00
562	14:50	13.50 7.00	2006	10.00	9.00
560 561	10.20 12.20	9.50	2004	6.20 8.00	5:50 7:00
990	8.20	7:50	2003	8.50	6:50 8:00
517	New 7:00	5·75 6·00	2001	7.50 7.00	7.00
516	8.00	7.50	2000	6.00	5.50
514 515	7.50 New	6:00 4:25	1870	55.00	21.00
513	New	4.75	1865	19.00	15.00 18.00
511	New 8.00	8.25	1855	14.00 16.00	13.00
410 510	6.20	5.00	1845 1859	10 00 12 00	9:00
409	6.75 8.25	6.00 7.50	1840	18'00	17.00
405%	5.5	4°50 6°00	1830 1835	18.00 12.00	12.00
26636	6.20	5 75	1825	11.00	8.00
264	5.75	5:00 4:25	1815	14.00	18:00
261 263	5 00 4 50	8.75	1805		9.00
260	8.75	3.00 4.25	1809	8.00	7:00
256 257	4·25 5·50	3·50 4·75	1565	19.50 22.50	18.50 21.50
253 254	5.50	4.75	1555 1560	16.20	18.50 15.50
251	5°00 4°25	4°25 3°50	1550	12.20	11:50
209 250	5.00 3.12	4.00 3.00	1545	18.50 10.50	9.50
206	5.00	4.00	1535	15.20	12·50 14·50
200%	8:75 5:00	3 (0 4·00	1525 1530	11.50 13.50	10.50
95½ 200	4.00	3.25	1520	9.50	18·50 8·50
95%	7·25 8·50	6:00	1510 1515		11.50
90%	7.00	4.20	1505	8.20	7°50 9°50
	5.75	3°25 4°50	147614	9.75	7:50
90%		0.00	1476	8.20	6.25
90 90¾	\$2.00 5.20	\$1.20	1475%	Price. 8.25	Price.

Reversible Mortise Knob Locks.

Per No. 511, 3%x3¼ in., Lacquered Iron Front, Heavy Iron Bolts, Wrought from Striking Plate, Thuned Malleable Iron Key, one Tumbler, 12 changes.

No. 513, 33x33¼ in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Striking Plate, Thin Straight Bit Brass Key, one Tumbler, 12 changes.

No. 515, 4x3½ in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Striking

Plate, Tinned Malleable Iron Key, one Tum bler, 12 changes.

o. 517, 4x3; in., Lacquered Iron Fron',
Heavy Iron Bolts, Wrought Iron Striking
Plate, Thin Straight Bit Brass Key, one Tum-bler, 12 changes.

Mortise Knob Locks-To Reverse the Latch Take Off the Cap.

No. 811, 3½x3 in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Striking Plate, Tinned Malleable Iron Key, one Tumbler, 12 changes.

No. 813, 3½x3 in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Striking Plate, Thin Straight Bit Brass Key, one Tumbler, 12 changes.

No. 815, 4x3½ in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Striking Plate, Tinned Malleable Iron Key, one Tumbler, 12 changes.

No. 817, 4x3½ in., Lacquered Iron Front, Heavy Iron Bolts, Wrought Iron Front, Heavy Iron Bolts, Wrought Iron Striking Plate, Thin Straight Bit Brass Key, one Tumbler, 12 changes.

Office of Russell & Erwin Mfg. Co., \ New Britain, Conn., July 1, 1876. \ We have reduced the list prices of the following numbers of Locks and Knobs, to take effect this day:

Per Locks

No.	lozen.	No.	dozen.
0	\$3.25	OFF	\$17.00
0.00	4.75	360	
		Des	5.50
	7.00	361	7.00
01/4	9.00	0361	
0036	8.00	0362	9.00
01/2	4.25	0363	. 11.00
0%	5.75	0364	. 13.00
00%	8.00	370	. 6.20
0%	10.00	0371	8:00
00%	10 00	0372	
1	11.00	0373	# 18 - mile
01	11.00	0374	14'00
11/4	13.00	and a	
011/6	13.00	Office	44.00
0134	13.00	0383	. 13.00
02	14.00	0004	48.00
40	13.00	EO.4	
		504	
040	15.00	5041/4	. 6.00
	15.00	508	6.00
018 % keys	17:50	5081/	
18%	18.00	551	. 3.25
013%	18.00	552	. 4.09
013%, 2 keys	20.20	557	3.00
18%	21.00	599	. 4.00
013%	21.00	604	3.00
013%, 2 keys	23.20	605	4.25
23	9.00	606	3.75
40	1.50	607	. 5.00
250%	3.25	612	. 5.75
251%	4.75	61216	4.25
255	4.50	629	. 3.00
256	6.00	630	4.75
300	8.25	630 %	
0300	5.00	631	5.75
301	4.75	650	3:50
0301	7.50	651	
302	9.50	710	. 13.00
0302	9.50	711	44-00
303	11.50	712	13.50
0303	11:50	712, 2 keys	. 16:00
304	13.50	713	4.00 - 00.00
0304	13.50	713, 2 keys	
810	4.25	71316	18.50
0310	6.00		
311	5.75		21.50
0311	8.50	713%, 2 keys	
312	10.20		
0312	10.20	ana.	4.75
313	12:50	800	
0313	12.50		
314	14.50	COARA	
0314	14.50		6:00
315	17:50	00.	
316	20.50	050	0.00
0004	9.50	ONOLL	
0.000		850%	
0323	11.50	851	
00.14	13:50	8511/2	
0324	15.20	855	
340	8.25	856	. 6.00
341	9.00	860	
348	11.00	8601/2	
844	13.00	861	. 4.50
350	4.25	861%	. 4'75

Door Knobs. 202 203 .\$6.25 6.75

Office of Norwalk Lock Company, South Norwalk, Conn, July 1, 1876.
New York Office, No. 82 Chambers street.
Terms.—All goods or our illustrated book to page 267 subject to discount of 35 per cent, cash. Two per cent. may be deducted from all bills, if paid within 30 days from their date. Funds you in Norw Work. deducted from all bills, if paid within 30 days from their date. Funds par in New York, Boston or Philadelphia. All orders subject to our ruling prices at date of shipment. Freight prepaid to New York. Prices not guaranteed. We have this day reduced the list of the following numbers of Locks, Knobs, etc.

Mortise Knob Locks and Latches. Nos. 1 400 402 412 418 422 \$1:50 3:25 4:75 5:50 7:00 9:00 Nos. 428 432 450 455 460 465 \$11:00 13:00 6:00 7:50 9:50 11:50

NOB		. 470	475	480	4	85	490	495
		\$13.50		8:50	10	50 1	2.50	14.50
Nos		. 496	500	515		32	533	534
		\$14.00	17.50	20:50	7	50	9:00	11:00
Nos		. 585	540	545	. 5	55	558	560
		\$8:00	9.50	11.20	13	50 1	5.00	15:50
Nos		. 565	57	16	578	58	0	585
		\$18.00			15.50	18	50	21.50
		Rim	Knot	b Lut	ches.			
Nos	710	720	7	25	730	2	40	750
	\$4.00	8.0		.00			.00	4.00
		Ri	m Dea	d Loc	ke.			
Nog.	.860	865 8	75 8	880 8	885	890	900	905
			00 4	25 3	1.75	5 00	4.25	
		Rin	n Kn	ob Loc	ks.			
Nos	1240	1942	1243	5 1	255	1267	1	126736
	\$3.25	4.75	4*50) 6	00.5	3.00		3.25
Nos	1268	126836	1265) 1:	270	1502		1503
	\$4.50	4.75	4.50) 6	00°6	3.25		4 75
Nos	1507	1508	1510) 1	511	1515	. 1	1516
	\$4.20	6.00			3.25	6.00)	7:50
		1	Door 1	Karho				

Nos...300 301 312 313 320 323 338 339 \$1.75 1.75 2.25 2.25 6.25 6.25 6.75 6.75 We have added the following new goods to our variety since the issue of list of July, 1875. Mortise Knob Locks. With Patent Reversible Latch .- 5-16 inch Hub.

No. 403, 3½ x3 in., Iron Front Bolt and Striking
Plate, Iron Hub, Tinned Malleable Iron Thin
Bit Key, 1 Tumbler. \$3.25
So. 405, 3½ x3 in., Iron Front Bolt and Striking
Plate, Iron Hub, Brass Thin Bit Key, 1
Tumbler. \$4.25

Plate, Iron Hub, Brass Thin Bit Key, 1
Tumbler.

No. 413, 3½ x3 in., Iron Front Boit and Striking
Plate, Iron Hub, Tinned Malleable Iron Thin
Bit Key, 1 Tumbler, 12 changes.

No. 414, 3½ x3 in., Iron Front Boit and Striking
Plate, Iron Hub, Brass Thin Bit Key, 12
changes.

No. 471½, 4x3½ in., Iron Front Boit and Striking
Plate, Iron Hub, Tinned Malleable Iron Thin
Bit Key, 1 Tumbler.

No. 472½, 4x3½ in., Iron Front Boit and Striking
Plate, Iron Hub, Brass Finn Bit Key, 1
Tumbler
No. 472½, 4x3½ in., Iron Front Boit and Striking
Plate, Iron Hub, Brass Finn Bit Key, 1
Tumbler
No. 473½, 4x3½ in., Iron Front Boit and Striking Plate, Iron Hub, Brass Finn Bit Key, 1
Tumbler
No. 473½, 4x3½ in., Iron Front Boit and Striking Plate, Iron Hub, Tinned Malleable Iron
Thin Bit Key, 1 Tumbler, 12 changes.

6-00

No. 472%, 4x3% in., Iren Front Belt and Strik-ing Plate, Iron Hub, Brass Thin Bit Key, 1 Tumbler, 12 Changes. Mortise Knob Locks.

Right or Left Hand. To Reverse the Hand, take of the Cap and turn over the Latch.—5-16 inch Hub.

Take, fron 11th, Brass Thin Bit Key, 1 Tumbler.

10. 471%, 4x3% in., Iron Front Bolt and Striking Plate, Iron Hut, Tinned Malleable Iron Thin Bit Key, 1 Tumbler, 12 changes.

10. 472%, 4x3% in., Fron Front Bolt and Striking Plate, Iron Hub, Brass Thin Bit Key, 1

Tumbler, 12 changes.

10. 1239, 4x3% in. Fron Front Bolt key, 1

11. Tumbler, 12 changes.

12. Cpright Rim Knob Locks.

With Patent Reversible Latch.—5-16 inch Hub.

o. 1239, 4% x3% in. Iron Bolts, Iron Hub, Tinned Malleable Iron Thin Bit Key, 1 Tum-

Tinned Malleable Iron Thin Bit Key. 1 Tumbler.

No. 1241, 43gx33g in., Ir'n Bolts, Ir'n Hub, Brass Thin Bit Key. 1 Tumbler.

No. 01300, 43gx33g in., Iron Bolts, Iron Hub with Stop, Tinned Malleable Iron Thin Bit Key, 1 Tumbler.

No. 01305, 43gx33g in., Iron Bolts, Iron Hub with Stop, Brass Thin Bit Key, 1 Tumbler.

No. 01315, 43gx33g in., Iron Bolts and Thumb Bolt, Iron Hub, Tinned Malleable Iron Thin Bit Key, 1 Tumbler.

No. 01320, 43gx33g in., Iron Bolts and Thumb Bolt, Iron Hub, Brass Thin Bit Key, 1 Tumbler.

Cpright Rim Knob Locks

Right or Left Hand. To Reverse the Hand, take

Right or Left Hand. To Reverse the Hand, take off the Cap and turn over the Latch.—5-16 inch

No. 01271, 414x314 in., Iron Bolts, Iron Hub, Tinned Malleable Iron Thin Bit Key, 1 Tum-bler. Truned Malleable Iron Thin Bit Key, 1 Tumbler.

No. 61271%, 4/gx3½ in., Iron Bolts, Iron Hubwith Stop, Thoned Maleable Iron Thin Bit Key, 1 Tumbler.

No. 01272, 4/gx3½ in., Iron Bolts, Iron Hubbars Thin Bit Key, 1 Tumbler.

No. 01272, 4/gx3½ in., Iron Bolts, Iron Hubwith Stop, Brass Thin Bit Key, 1 Tumbler.

No. 01273, 4/gx3½ in., Iron Bolts and ThumbBolt, Iron Hub, Tinned Malleable Iron ThinBit Key, 1 Tumbler.

No. 01274, 4/gx3½ in., Iron Bolts and ThumbBolt, Iron Hub, Tinned Malleable Iron ThinBit Key, 1 Tumbler.

No. 01274, 4/gx3½ in., Iron Bolts and ThumbBolt, Iron Hub, Brass Thin Bit Key, 1 Tumbler.

MALLORY, WHEELER & CO. have this day made the following changes in their list prices.

DISCOUNTS.

Until further notice the discount on all Malory, Wheeler & Co.'s goods, including Padocks and Padlock Keys, will be 25 and 6 per cent. Ten per cent. extra discount for prompt cash. SARGENT & Co., Agents.

New York, July 1, 1876.

Sparks' Upright Rim Knob Locks.

Reverse by simply pulling La ch Bolt forward and turning half round. Without Stop. Old Price. New Price. Per doz. Per doz. ...\$5.50 \$3.00 ...700 4.50 Sparks' Upright Rim Knob Locks.

Reverse by simply pulling Latch Bolt forward and turning half round. With Stop. No. 00211, 4% in., same as No. 0211, but with

Reverse by simply pulling Latch Bolt forward and turning half round. With Stop.

With Thumb Bolt No. 0243¼, 4¼ in \$8.75 No. 0251¼, 4¼ in 10.25 Rushby's Upright Rim Knob Locks.

| Reverse by removing Cap. Without Stop. | Old Pric. | New Price, | Per doz. Sparks' Upright Rim Knob Locks.

No. 001, 4 in... No. 001%, 4 in... No. 0211%, 4½ in... No. 0215%, 4½ in...

0210%, 4½ in. 725 625

Rushby's Horizontal Rim Knob Locks.

Reverse by removing Cap. With Stop.
Old Price. New Price.
Per doz.
Per doz.
Per doz.
9239%, 4¼ in. \$575 \$325
9247½, 4¼ in. 720 475
0243½, 4½ in. 700 475
0251¼, 4½ in. 850 625
With Thumb Bolt. No. 023934, 434 in No. 024734, 434 in No. 024334, 434 in No. 025134, 434 in Sparks Mortise Knob Locks. Reverse by simply pulling Latch Bolt forward and turning half round.

Old Price. Ne \$8.25 Rushby's Mortise Knob Locks.

No. 779, 3½ in. No. 781, 3½ in. No. 783, 3½ in. No. 784, 3½ in. No. 787, 3½ in. No. 879, 4 in. No. 881, 4 in. No. 884, 4 in. No. 887, 4 in. .. 7°00 ..11°00 ..8°50 ..13°00 ..15°00 Builders' Mortise Knob Locks

Wrought iron inside work. ing Latch Bolt forward a

55				
Wrought Ir	Mortise Ko	c. Reverse	by removing	-
No. 960, 33, No. 960, 3 No. 964, 4 i No. 964, 4 i	Caj in	Old Price Per doz.	Per doz. \$4.50 6.00 5.50 7.00	
Rack Tum Changes.	Builders' Mortis bler, Wrought Reverse by si and turning half	Iron Inside mply pulling round.	Work, 24 Z Latch Bolt	
No. 995, 356 No. 996, 356 No. 997, 356 No. 998, 356 No. 999, 4 ii No. 1000, 4 No. 1001, 4 No. 1011, 43	in	Per doz.	\$7:50 9:50 11:50 13:50 8:50 10:50 12:50 14:50 9:50	
No. 1012, 43 No. 1013, 43 No. 1018, 43 Rack Tum	Mortise Kr	ob Locks.	11:50 13:50 15:50 e Work, 24	
Chn		Pardag	Can. New Price. Per doz. 87:00	1
No. 975, 4 1 No. 975, 4 1 No. 976, 4 1 No. 977, 4 1 No. 979, 4 5 No. 980, 4 6 No. 981, 4 5 Easy &	in i	9:00 11:00 13:00 15:00 12:00 16:00 Mortise Kno	11:00 13:00 8:00 10:00 12:00 14:00 11:00 13:00 15:00	
No. 2500, 33 No. 2501, 33 No. 2510, 4 No. 2511, 4	inin	Old Price Per doz. \$6.50 8.00 7.50 9.00	New Price. Per doz. \$6:00 7:50 7:00 8:50	1
Two Spring	gs to Latch, W Reverse by re	rought Iron I moving Cap.	New Price	
No. 2600, 33 No. 2601, 33 No. 2610, 4 No. 2611, 4	≨ in ≨ in in in	7:50 8:50	\$5.50 7.00 6.50 8.00	1
Rack Tum Changes simply pu half roun	Spring Builders' bler. Wrought Two Springs alling Latch Bo	Iron Incide to Latch. olt forward	Work. 24 Reverse by and turning	1
No. 2503, 33 No. 2504, 33 No. 2505, 33	≰ in ≼ in ≼ in ≼ in	10.50	New Price. Per doz. \$7.50 9.50 11.50 13.50	-
No. 2512, 4 No. 2514, 4 No. 2515, 4 No. 2515, 4 No. 2521, 4) No. 2521, 4)	in. in. in. in. in. in. in. iu. iu. iu. iu. iu. iu. iu. iu. iu. iu		8°:0 10 50 12°:50 14°:80 9 50 11°:50 13°:50	1
Rack Tum	Spring Builders' bler. Wrought Two Springs t	Mortise Kno Iron Inside o Latch. R	ob Locks. Work. 24 everse by re-	-
No. 2602, 33 No. 2603, 33 No. 2604, 33	€ in € in	Old Price. Per doz. \$8'00 10'00 12'00	New Price. Per doz. \$7.00 9.00 11.00 18.00	1 1
No. 2605, 34 No. 2612, 4 No. 2613, 4 No. 2614, 4 No. 2615, 4 No. 2620, 44 No. 2621, 43 No. 2622, 43 No. 2623, 43	6 in	14 '00 9 '00 11 '00 15 '00 16 '00 14 '00 16 '00	8 00 10 00 12 00 14 00 9 00 11 00 13 00 15 00	1 3
Wrought Ir pulling La With 2 Ra	on Inside Works tch Boit forward tck Tumblers.	rk. Reversed and turning	e by simply ghalf round.	r
No. 41, 4%	in	Per doz. \$18.50 19.50 Tumblers.	New Price. Per doz. \$17.50 18.50	b
No. 091, 4 in No. 91, 4½	in	22.50	\$1.20	the
No. 84, 4% i	n	10.00	8.00	a I
No. 189, 414 No. 191, 414	inin.	Old Price. Per doz. \$10.50 9.00	New Price. Per d z. \$9.50, 8 00	1 1
	ininininininininininininininininininin	Old Price.	Now Dries	e a la s p
	Rim Closet or	Dead Locks.	New Price.	fi 4 d
No. 170%, 8	in i	5.00	4°25 4°75 4°75 5°25 4°00 3°50	n a T s i
	iein	6.50 tches.	4.75 3.75 5.00 4.25 5.75	v h
No. 202, 4 in	inin	Per doz. \$3.75 5.00 4.0) 5.00	New Price, Per doz, \$3:00 4:00 3:25 4:25	p u n t
No. 0, 1%x3		Old Price. Per doz. \$2 00 nobs.	\$1.20	BBB
No. 216, 2½ No. 218, 2½ No. 236, 2½ No. 238, ½½ No. 440, 2½ No. 442, 2½ No. 444, 2½ No. 446, 2½	in	Per doz	\$1.75 1.75 2.25 2.25 6.25 6.25 6.75	TStite
No. 254, 2% No. 254, 2% No. 255, 2% No. 256, 2% No. 257, 2% No. 258, 2% No. 259, 2%	inininininininin	Old Price. Per doz \$2.25 \$2.25 \$100 \$100 6.75 6.75 7.25 7.25	\$1.75 1.75 2.25 2.25 6.25 6.25 6.75	T the quantity of the state of
,	in	Old Price. Per coz.	New Price.	1 t

	Half Knobe.	
5	For Screen and Blind Doors.	
	No. 0253, 134 in	1.77
	Bronze Metal Door Knobs.	
)	21/4 in. with Round Rose.	
i	Old Price.	New Price
)	Per Patr.	Per Pair.
	No. 1137 \$2.50	\$5.5
ı	No. 1139 2:50	2.2
	No. 1141	9-9
	No. 1145 2·50	2.2
	No. 1147 2·50	2-2!
	No. 1149 2·50	5.5
)	No. 1151 2·50	9.20
2	No. 1187	1.75
,		4 10
ì	9% in. with Round Rose.	
)	No. 1167\$2.75	83·50 2·50
)	No. 1169. 2.75 No. 1171. 2.75	2:54
,	No. 1173	2:50
	No. 1175 2·75	2.50
7	No. 1177 2.75	2:50
	No. 1179 2.75	2.50
	No. 1180	2.35
	No. 1183. 2.75 No. 1189%. 2.50	2:25
1		4 40
1	2% in. with Elongated Rose.	00.00
1	No. 1121 \$2.75 No. 1123 \$2.75	\$2.50 2.50
	No. 1125 2.75	2:50
H	No. 1127 2.75	2.50
1	No. 1129 2.75	2.20
	No. 1181 2.75	2'50
	No. 1133 2.75	2.50
	No. 1185 2.75	2.50
	No. 1185	2.00
ì	No. 1186 2.25	2 00
,	No. 1153\$3°25	\$3.00
	No. 1155	3.00
J	No. 1159 8·25	3.00
ı	No. 1161 3·25	3 00
1	No. 1163 8·25	8.00
	No. 1165 8.25	8.00
J	No. 1166 8'00	2.73
	No. 1181	3*00 2*75
	410. 4100 0'00	40
	DDITIGH IDON WINE	7.00
	BRITISH IRON MARKE	1.
	(Specially reported by cable for The In	con Age.)
۱		E 10mg

WEDNESDAY, July 5, 1876.

Scotch Pig.-The market is quiet, and but little busines doing. Prices are steady and

Manufactured Iron .- There is no demand whatever, and quotations are nominally £8, 10/ @ £9 for best Staffordshire Bars.

Rails.-There is a little better demand for Iron Rails, but prices are weak. Welsh are quoted £5. 5/ @ £5. 15/.

IRON.

American Pig.-Owing to the holidays no transactions of any magnitude have been reported, and we quote as before : No. 1 Foundry, \$22 @ \$23; No. 2 Foundry, \$20 @ \$21; Gray

Scotch Pig .- The condition of the market is unchanged since our last review. We quote Coltness, \$30; Glengarnock, \$28 @ \$29; Gartsherrie, \$29, and Eglinton, \$27.

Rails .- In the absence of transactions we continue our quotations of \$39 @ 42, at mill. for Iron and Steel, nominally, \$60 @ \$63, at

Old Rails .- We quote \$21.50 @ \$22, without sales of any importance.

Scrap.-The market continues quiet and unchanged. We quote \$26 for Wrought, from vard.

METALS.

Copper.-Toward the close of last week rather improved feeling began to manifest itself in the Copper market, interrupted since by the national festivities. The dealings were not large, but a slight recovery nevertheless took place, 200,000 lbs. Lake Superior changing nands at 191/c. @ 198/c., the latter bid at the close without sellers. No futures are to be had at prevailing rates. Baltimore continues scarce, and we quote the same nominally 19% c. @ 20c. in the London market, the decline which set in with the commencement of last month, has made further important headway, there having been a fresh drop of £2 in Best Selected, and £1. 10/ in Ctili Bars, the former now being cabled £80, and the latter, £74. 10/. It is not easy to explain this rapid decline in Europe, unless we are to attach importance to the fact that the latest heavy orders for guns have been for steel field pieces, instead of cannon cast from phosphor bronze. Thus, the Italian govern ment, in May sent a commission of artillery officers to Prussia for the immediate purchase of 00 cancon to be delivered in September. After due deliberation with the local artillery department the order was handed over to Mr. Krupp, Essen, and the guns will be steel merely This would go to show that the latter metal in some leading quarters at least is again superseding the new alloy, whose sudden introduction ave such an impulse to the value of Copper, which is the main component of it. We would, however, remark that for machinery bearings and many other castings the new alloys of Copper are fast gaining ascendency in Europe. The uses of Copper will, therefore, in any event be more extensive, even supposing that steel in he end prove more practical for field artillery. The manufactures of Copper are sustained. We quote: New Sheathing, 31c.; Bolts and Braziers, 32c.; Bronze and Yellow Metal Sheathing, 20% c. @ 21c.; and Yellow Metal Bo ts, 26c. @ 28c., all cash.

Tin .- A sudden advance of £2 in English Fin was telegraphed to-day from London. Straits having recovered to £74. 10/ in the meantime. This improvement is in all likelihood due to the deliveries which have probably ex ceeded expectations, while the shipments from he East are notoriously light; the Netherland Frading Society having at its late sale adopted he policy of meeting the market. The unsold quantity held by that corporation is hencethat at length the London stock will decrease a

deliveries remain steady. Under these circumstances we may be on the eve of steadily rewhole business may undergo a healthy trans- to note in the bituminous trade. formation as we proceed toward the fall season. Our own market has not yet had sufficient leisure to disentangle itself from the paralyzation entailed by the holidays, but will, no doubt, be in a position to respond to the English advance if lasting. As heretofore we quote large lots in gold: Straits, 17c. @ 171/c.; English Refined, 17% c. @ 18c., nominally : English Com mon, 171/c. @ 178/c.; and Banca, 211/c. @ 32e Tin Plates-Any serious advance in Tin would fortify the position of the Tin Plate producers, and the latter article might then definitively touch bottom, should this circumstance coincide with a revival in the general demand for the fall trade. It is high time, indeed, that something favorable should occur in this branch, which has been an uninterrupted source of losses to all holders unable to rid themselves of their goods almost as fast as they got them. We are in great hopes that better times will soon dawn upon this important branch of the metal trade. The week has necessarily been a quiet one, and we repeat our quotations in gold, per box, ordinary brands, large lots: Charcoal Bright, \$6.75 @ \$7: do. Ternes, \$6.37 @ \$6.50; Coke Tin, \$6; ditto Ternes, \$5.50.

Lead. - There has been no change for the better in the Lead market. The number of larger consumers is more limited than a year of two ago, and even they do not by a great deal use as much Lead as they did at that time. A general revival in business is what Lead is waiting for as much as any other metal, and until that desideratum is at hand we cannot exwaiting for as much as any other metal, and until that desideratum is at hand we cannot expect much activity, nor well sustained values. Speculation cannot do ft. The government seems to have accepted 6'30c., gold, for 100 tons last week; the sales since have summed up about 75 tons in lots as 6%c., gold. We quote Common Domestic, 6'30c. @ 6'35c., gold. At St. Louis soft Missouri at last accounts stood 7c., currency, and Common, ditto, 6'40c. @ 6'45c., currency. The receipts at St. Louis from Jan. 1st to June 24th were 283,422 pigs, against 236,367 in 1875. Foreign Lead we quote 6%c., gold, nominally for Common. The war in Europe has at length begun, and although for the present confined to Turkey and one of her vassal Staies, it is expected that Russia will soon take a hand in it, should Servia be beaten. The remaining powers may then be induced to take sides, and the Lead market would soon feel the favorable effect of it. Till now Europe has continued to droop from a lack of trade demand. The manufactures of Lead are quiet, as follows: Ser. uroop from a lack of trade demand. The man-ufactures of Lead are quiet, as follows: Bar, 8½c.; Pipe, 9½c.; and Sheet, 10c., less 10 per cent. to the trade.

8%c.; Pipe, 9%c.; and Sheet, 10c., less 10 per cent. to the trade.

Spelter and Zinc.—Should, after all, as seems to be foreshadowed by the slight stir in Copper, the Brass manufacturers be induced to re enter the markets for a supply of raw material, the last may have been seen of the extreme depression in Domestic Spelter Till this change occurs we see no relief from the present dullness. We quote: Domestic Spelter, nominally 7%c. @ 7%c., currency; and Foreign, 7c. @ 7%c., gold, according to brand, without any sales of note in either; Europe remains steady at 8%c. @ 8%c., gold, for Foreign, and 9%c. @ 9%c., currency, Domestic.

Antimony.—London is remarkably firm at the lately enhanced rates, and whatever may henceforth be sold here is not easily replaced. Our stock is much reduced, but the demand being small rates remain unaltered between 15%c. and 16c., gold.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending July 4, 1876 :

Gomez, Pearsall & Co.

Hardware.

ARTER COLORES	Gomenia a contenti to Co.
Brown Bros. & Co.	Scrap, tons, 5
	Henderson Bros.
Files, cks., 5	Pig tone 900
Boker Hermann & Co.	Pig, tons, 200 Marvel Wm. D.
Mdse. pkgs., 1	Marvel Wm. D.
	Ore, tone, 107
Arms, cs., 12	Middleton & Co
Crook J. B. & Co.	Middleton & Co.
Guns, cs., 2	Knees, 7
Guille, Co., a	Scrap, lots, 1; pkgs.
Erie and North Shore	
Line,	88
	Perkins, Livingstone,
Casks, 4	Don't & Co.
Field Alfred & Co.	Post & Co.
	Pig, tons, 100
Casks, 1	Robbins C. & Son,
Cutlery, cs., 10	
Frasse P. A. & Co.	Button boxes, 80
Come at all the con	
Saws, cr., 1	Et and
Harmar, Hayes & Co.	Steel.
Cases, 1	Carey & Moen,
Howard, Sanger & Co.	Rods, bdls., 45
Cases, 5	Frith Edward,
Talah T Tlond	
laigh J. Lloyd,	Cases, 15
Wire rods, bdls., 148 Laughland & Co.	Hugill Chas.
anghland & Co	
Laugilland & Co.	Packages, 17
Wire, bals., 150; cks.,	Naylor & Co. Steel, tons, 90 Prosser Thos. & Sons,
5; crates, 12	Steel tone 90
	Decon tour, so
Merrick T. B. & Co.	Prosser Thos. & Sons,
Guns, cs., 49	Mdse. pkgs., 104
Merchants' Dispatch Co.	Woodford W O
	Woodford W. O.
Guns, cs., 1	Cases, 14
Orgill Jos.	Bundles, 43
Packages, 1	Order.
Pratt E. C. Bro. & Co.	Rods, bdls., 168
Packages, 5	Packages, 120
Peters Bros.	Cases, 1
Mdse. pkgs., 4	
Much page,	35.4.1.
schoverling & Daly,	Metals.
Mdse. pkgs., 8	Dance & Cook
strasburger, Pfeiffer &	Bruce & Cook, Tin plates, bxs., 360
	Tin plates, bxs., 360
Co.	Gomez, Pear-all & Co.
Cases, 3	
	Scrap, brass, bbls.,
Tolley H.	2100
Guns. cs., 1	
Guns, cs., 1 Van Wart & McCoy,	Scrap, copper, bbis.
van wart & siccoy,	1200
Mdse. pkgs., 4	Scrap lead, bbls., 500
Cases, 4	
	Jackson R. D.
Weyel & de Gress,	Bar tin, bbis., 10
Arms, cs., 17	
Wiebusch & Hilger Mfg.	Naylor & Co.
	Tin plates, bxs., 1238
Co,	Phelps, Dodge & Co.
Mdse. pkgs., 15	
	Mdse, pkgs., 1000
Wolffe H. & Co.	Ward Jas. E. & Co.
Barrels, 5	
Ward Asline,	Scrap, metal, hhds.,
	10
Cutlery, cs., 1	
Order.	Order.
	Lead, pigs, 1439
Cases, 1	Tin plates, bxs., 829
Iron.	Course months
	Scrap, metal, pkgs.
Alexandre F. & Sons,	211
Bundles, 285	Zinc, plates, 2445
	-

COAL

There are no features of importance to be noted in the trade this week. Outside Coals are. perhaps, a little firmer with fewer concessions. In the retail trade there is a trifle more demand, orth quite manageable, and Continental con but only what is to be expected at this season. sumers are therefore compelled to resort Dealers are looking for a little more trade bye o the London with greater frequency. If, then, and bye when the fifteen cent rise in price takes the quantities on the way from the Straits and place. Production is considerably ahead of the Australia to London continue to be limited in same time last year, probably something like a amount during the present and ensuing month, million tons. At present there is very little there seems to be a reasonable prospect in view talk about any break up in the combination, people generally having accepted it as a fixed \$1.75 thousand tons or more, provided the general fact for the present year at least. Freights re- dullness prevails in every department, and the the formation of the Western combination

prices for Coal, which are 5 cents higher than covering values in the Tin markets, and the those for June. There is nothing of interest

to note in the pitaling	D cresp	Dr. ence.				
We quote as follows	:					
Cumberland, at Georgeto	wn.			\$3:57	2	\$3:75
West Virginia, at Baltim						6:00
Kittaning f. o. b., Baltin					2	4.35
Newburg Orrel. at	ore.				130	4.50
Despard, at Baltimore					18	4:50
					13	4.75
Broad Top, at South Am	юу			0.0	6.80	
Morrisdale, Wigtons				0.0	10	2.00
Cunard					48	5.00
Consolidation Coal Co. f.	o. b.	., Ge	orge-			
town					03	3.62
Consolidation Coal Co.	. 0.	b., 1	3alti-		45	
more					Oh.	3.90
In barges at New York					0	5.20
Manufact Cont Co & a b	10-	islam.			(a)	4.00
Maryland Coal Co. f. o. b.						
Maryland Coal Co. f. o. b	" (46	orge	rown	0	@	3.49
PRICES	POR .	TULY				
				-		
		100		1		40
	-2	9	8		-2	9
	0	H	1 2	. 0	9	100
	- 12	25	0 1	600	-	45

	Lam	Stea	Bro	Egg	Stor	Che
PENNSYLVANIA COAL CO						J.
Pittston 4	1.19	1.85	4.95	5.05	5.65	4.95
DELAWARE AND HUDSON ken.	CAN N. J	AL.	CO.,	at	Weel	- 1
		1				
Lackawanna 4	75 4	1.82	4.95	2.00	2.65	
	_					
LEHIGH AND WILKES-BARR			co., 1	.o.b.	at 1	Port
Johnson	1, N.	J.				
Old Company's Summit. 5						
Honey-Brook Lehigu 5 Wilkes-Barre 4	75 4	-85	1.95	5.02	5.65	4.85
Plymouth Red Ash		4	95	5.15	5.75	4.95

PHILADELPHIA AND BEADING COAL AND IRON CO., at Port Richmond, Philadelphia. at Port Richmoud, Philadelphia.

Hard White Ash Coal. . . 4 40 4 50 4 60 4 70 5 30 4 50 Lorberry..... Lykens Valley... Deliverable at the Williamsburgh Yard.

DELAWARE, LACKAWANNA AND WESTERN, at Hobo-ken, N. J. Scranton 4.75 4.85 4.95 5.05 5.65 4.95

FREIGHTS-PER TON OF 2240 LBs.

PORTS.

Philadelphia,

Baltı

	1	A	E	H
Augusta, Me			41.44	
Albany Amesbury, Mass	****		\$1.75	
Amesbury, Mass	\$1:00	****	2.00	****
Bangor, Me	1.00	****	1.20	\$1.50
Baltimore	***90	1:30	1:45	1:60
Bridgeport, Ct	.70	- 1951	1.40	1:40
Bristol R. I	*85			
Bristol, R. I. Cambridgep't, Mass	1:00			
Derby			4111	****
Dighton			1.40	1.20
East Cambridge	*1.00	1111	22.12	27.55
Fall River	'80	1.25	1.40	1.40
Hackensack		****		****
Hallowell, Me				****
Hartford			1.20	1 4.00
Hoboken,	'40		1.20	1.2
Hudson	40		1.30	1.4(
lersey City				-
Lynn, Mass	1.10			****
Middletown	1		****	****
Mystic			1.50	
New Bedford	-85		1.40	1.40
Newburyport	1.10		1.65	1.70
New Haven	65		1.40	1.40
New London	*80		1.40	1-40
Newport	'85			
New York	*40	.70	1.25	1.30
Norwalk	.70		1.40	
Norwich	*90		1.45	
Pawtucket	.90		***	
PLiladelphia	****		.90	
Portland	'90		1.45	1.50
Portsmouth, N. H	1.10	1100	1.60	1.70
Providence	'80	1.25	1.40	1.40
Poughkeepsie, N. Y	.90			-
Rockland				****
Rockport				****
ag Harbor	1:00	***		
Balem, Mass	1.00		1.60	1.60
atisbury Pt., Mass				
tamford	65			
aybrook	.75			
tonington	*80			
aunton				
Proy	.65			
Varren, R. I	*85			
Wareham	****		1.45	1.60
Veymouth				1.65
Vilmington, N. C				1.25

*3c. per bridge extra. \dagger And Sound Towing. Harbor Freights, 40 cents.

OLD METALS, PAPER STOCK, &c.

Old Metals still continue quiet, as there is little demand from consumers for any description of stocks. There is, however, a better feeling in connection with lead, and quotations are more easily obtained. The call for Rags and Paper Stock is very light, and prices have a downward tendency. White Rag s No.1 is selling at 51/2c. a pound on sixty days time, being the highest offer made to dealers for their accumulations. The purchasing prices offered by the dealers are as follows:

Old Metals.—Copper, 15c. @ 16c. per lb.; Yelow Metal, 10c.; Brass, 9c.; Composition, heavy, 10c. @11c.; Lead, solid, 5½c.; Tea Lead, 5c.; Zinc, 4c. @ 4½c.; Pewter, No. 1, 13c.; do., No. 2, Sc. @ 10c.; Spetter, 5½c., Wrought Iron, \$21 per ton; Light do., \$12 per ton; Stove Plate, \$9 per ton; Light do., \$12 per ton; Burnt Iron, \$6 per ton. Rays, &c.—Canvas, Lineu, 4½c. @ 5½c.; do. Cotton, No. 1, 5½c.; No. 2, 2½c.; White, No. 1, 5c.; No. 2, 4c.; Colored, do., 2c.; Mixed, Wsolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1½c.; Jute Butts. 1½c. @ 2c.; Kentucky Bagging, 2; Jute Butts. 1½c. @ 2c.; Kentucky Bagging, 2; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakuar Jihn, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1½c.; Grass Rope, 2½c. @ 3c.

Old Metals.-Copper, 15c. @ 16c. per lb.; Yel-

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, July 5, 1876. Pig Iron.-Since our last report the market

main unchanged. We quote below the July general opinion seems to be that this will contique for several weeks to come. Having reached this conclusion, the feeling may be said to be a little steadier, and no special anxiety is manifested to do more than meet trade as it offers and wait further developments in regard to the future. As fairly representing the average sales, we quote: No. 1 Foundry, \$22 to \$22.50; No. 2 do., \$20 to \$20.50; and Gray Forge, \$19 to \$20. Market steady.

ORES .- The following are the f. o. b. quotations at Richmond, Va.: Magnetic, \$4; Specular for Bessemer, \$4:50; Selected do., 65 to 70 per cent. of Metallic Iron, \$5. At Cleveland we quote Lake Superior, \$7; and Republic mine, \$7.50.

BLOOMS .- The demand is moderate, and prices are unchanged as follows: Charcoal Scrap Blooms, \$47; Charcoal Ore Blooms, \$41 to \$42; Charcoal Billets of superior quality, from \$60 to \$62; and Bars for converting into Steel, made of best Champlain Iron, \$75.

BAR IRON.-There is no special change to note; the demand is light, and manufacturers are not looking for much business at present; consequently there is a steady feeling and no change in price. The production will be very light during the next few weeks. Many of the mills will be closed temporarily during the next week or two for repairs, stock taking, &c., and the suspension may be protracted unless the outlook is more satisfactory than at pres-In the meantime the best brands are quoted \$2.35, demand fair; other brands quiet at about \$2.25.

RAILS .- There is a very dull feeling in this department of business, and sellers begin to look around for fresh contracts. At present there is very little inquiry; lots of one hundred to three or four hundred tons for immediate delivery are being sold occasionally, but we do not hear of any large orders in the marwe do not hear of any large orders in the mar-Hard White Ash Coal. 4.75 4.85 4.95 5.05 5.65 4.85 Free Burning White Ash Coal. 4.75 4.85 4.95 5.05 5.65 4.85 Coal. 4.75 4.85 4.95 5.05 5.65 4.85 Schuylkill Red Ash. 5.25 5.75 4.85 Shamokin. 5.25 5.75 4.85 meantime the quoted prices is from \$50 to \$59 for Steel Rulls at mills, and \$39 to \$41 for Iron Rails. Market very quiet.

OLD RAILS.-We have a firm market for Old Rails, but transactions are not heavy, buyers being unwilling to meet the enhanced views of holders. Buyers could be found at \$22.50 to \$23, but holders are firm at \$24, cash, consequently there is scarcely anything doing. We quote \$22.50 to \$24.50; market unsettled.

SCRAP.-The demand for Scrap Iron continues equal to the supply, and late quotations are maintained as follows: Cast, \$16 to \$19; Wrought, \$26 to \$29; with sales chiefly at \$27 to \$27 50.

NAILS.-There is no change in price, although the demand is rather languid. We quote: \$3.25, with 25c. to 35c. per keg, discount, according to quantity taken.

TIN PLATES .- There is no change in price, but the demand is rather slow and disappointing. We quote, in United States currency: I. C., 10x14, \$8 to \$8.50; I. X., 10x 14, \$10.25 to \$10.75; Best Charcoal, leaded, 28x20, \$15 to \$16; other good brands, \$14.50 to \$15; good fair, \$14 to \$14.50; Bright Tin, for cans, &c., \$6.75 to \$7; good Bright Tin, do., \$6.50 to \$7; Coke, leaded, 14x20, \$6 to \$6.50.

LEAD .- The market is very quiet, and there is scarcely any business doing-particularly in Domestic, and quotations are nominal. Some holders ask \$6 50, while in other instances \$6.25, gold, is accepted for small lots. The market for Foreign Pig is also very quiet. We quote, Bar, 8%c.; Pipe, 91/c., and Sheet 10c.. less 10 per cent. to the trade.

SHOT.—The market is unchanged. We quote with 10 per cent. discount, cash in 30 days: Drop Shot in 25 lb. bags, 984c.; in 5 lb. bags, 10%c.; Buckshot in 5 lb. bags, 10%c.; Bar Lead in 5 oz., 1/2 lb. and 1 lb. bars, 8%c.

OLD METALS.-Brass and Copper are weaker. Old Lead is scarce and wanted. We quote: Heavy Old Copper, 161/2c. to 17c.; Light Tinned Copper, 151/c.; Copper Bottoms, 14c.; Heavy Red Brass, 14c.; Light Red Brass, 13c.; Heavy Yellow Brass, 121/c.; Light Yellow Brass, 111/c.; Heavy Clean Pipe Lead, 6c.; Junk Lead, 5%c.; Tea Lead, Light Paper, 6c.; Tea Lead, Heavy Paper, 5c.; New Zirc Clippings, 4½c.; Old Sheet Zinc, 4c.; Yellow Brass Turnings, 8c. to 10c.; Red Brass Turnings, 10c. to 12c.; Plumbers' Lead Joints, 61/8c.

PITTSBURGH.

Office of *The Iron Age*, 14 Fifth Avenue, †
PITTSBURGH, July 4, 1876. †
PIG IRON.—There has been very little business during the past week, nor was it to be expected, in view of the recurrence of the national holiday, taken in connection with the fact that it is customary with many of our mills to stop during the first half of July to take stock and repair. The general position of the market has not varied much for several weeks. Notwithstanding, the consumption recently has been light in consequence, partially, of the puddlers? strike, producers are hopeful of the future, and an increased demand is expected within the next few weeks, as it is probable quite a number of the mills will start up their puddling furnaces between now and the 1st of August. Stocks of ail grades are comparatively light, not only here, but at those points tributary to this market, and producers are hopeful of being able to obtain better prices this fall if there is any business at all. No. 1 Foundry, \$24 to \$25, 4 mos.; No. 2 do., \$22 to \$23; Gray Forge, \$21.50 to \$22.50; H. R. Charcoal, No. 1 Foundry, \$28 to \$30, 4 mos.; No. 2, \$24 to \$26; Cold Blast Car Wheel, \$40 to \$45. There was a sale reported during the week-the first for several months-at \$45.

MANUFACTURED IRON.-The market for Finished Irons continues dull, and while some of the mills have had about all they could do, they were sold ahead largely prior is without any essential change of feature; to the advance in prices. Ever since

orders have been coming forward sparingly, but we look for an improvement within next few weeks. Buyers, who have been holding off in expectation that the combination would go to pieces, we apprehend are pietty well satisfied now that manufacturers went to-gether this time with the determination to "Stick," will soon commence to place their orders, and with good crops there is every indication of at least an average fall trade. Prices are firm, but unchanged. Quotations may be given on a basis of \$2.30 to \$2.50, 60 days, for bars, according to size of order.

NAILS.-The Nail mills have been running steadily ever since the spring trade opened up, with the exception of a week or two during the puddlers' strike, but most of them will shut down a week or so now to take stock No. 1 Foundry, extra..... \$22.00 @ 23.00 and make repairs. It is reported that some makers have, until quite recently, been working up orders placed prior to the advance made by the Western combination, when prices were down to \$2.40 to \$2.50, 60 days. Stocks in first hands are light, but the West is reported as being well supplied, many buyers having an ticipated the advance, and bought largely ahead. Prices unchanged: \$2.85, 60 days, for orders for less than 200 kegs, and \$2.75, 60 days, for 200 kegs and upward.

STEEL .- The Steel mills are all busy, some of them working up to their full capacity, while others are not pressed. The market is all that ean be expected as regards business, although

ment of some 2600 tons by river last week to Johnsonville, Tennessee, which closes a contract, if we mistake not, of some 10,000 tons de liverable at that point.

COPPER.—Trade in Manufactured Coppe continues dull, and the general outlook is not favorable for an immediate improvement.

HARDWARE.-The Jacobus & Nimick Manufacturing Company have made some changes in discounts. Following are the new rates: On Locks, Latches, Knobs and Escutcheons, 35 per cent.; Scales 20 & 10 per cent.; Coffee Mills, 33 & 30 per cent.; Lull & Porter Hinges, 75 per cent. All other goods, 20 per cent. Two per cent. may be deducted from invoices, if paid within thirty days.

LOUISVILLE.

Messrs. Geo. H. Hull & Co., under date of July 1, writes us as follows: Our market remains about the same. Demand for Foundry and Mill grades is dull, as it might be expected at this season of the year. With the opening up of the stove foundries we look for a somewhat better demand, and should the mills continue in active operation we think that with the limited supply of good Forge Irons in stock, would have a strong tendency to stiflen prices somewhat. The usual time, 4 months, allowed on quotations below: HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores. \$24.00 @ 26.00

66							
	1 Mill,		6.6	6.6	84	20.00	@ 21 (
61	1 F'dr	y, fre		Alabama,			-
	and Te	nnes	see O	res		55.00 (@ 23.0
00	2 F'dr	y, fr	om A	Alabama,	Georgia		
	and Te	ennes	see O	res		21.00 (D 22.0
86	3 Mill.	from	Alab	ama, Geo	rgia and		
	Tenne	ssee (Dres			20 00 0	@ 21.0
	В	от в	AST 8	TONE COA	L AND C	OKE.	
No	1 E'de	v. fro	m Ha	nging Roo	dr Orea	499-00 6	9 93-1
44	9 44		4.6	46		21.00 (
	î Mill.		6.6	8.6	44	20.00 6	
64				Alabama,	Georgia	40 00 Q	9 ~1 (
	and To	nnou	age O	res	orcorgia	22.00 (2 99.0
64	o Etda	muce fr	oee o	Alabama,	Coopera	ee 00 (g 40 U
	and To	y, III	om 2	res	Georgia		2 01.0
	and Te	from	Alab	ama, Geo	note and	20.00 (\$ 21.0
		HOIL	(America)	ama, Geo	rgia and	19.00 (2 00.0
**	Tours						
	Tenne	ssee !	. M.	amount file		. 20 00 0	
No.	Tenne	y, fro	m Mi	ssouri Or	es	- (- 6
No.	1 F dr	y, fro	m Mi	ssouri Or	es	- 8	B -
No.	Tenne	y, fro	m Mi	ssouri Or	es	- (B -
No.	1 F dr	y, fro	m Mi	ssouri Or	es	- 8	B -
No.	Tennes 1 F dry 2 " 1 Mill,	y, fro	om Mi	BLAST CHA	RCOAL.	- 8	25°0
No.	Tennes 1 F dry 2 " 1 Mill,	y, fro	om Mi	BLAST CHA	RCOAL.	24.00 (25°0
No.	Tennes 1 F dry 2 " 1 Mill,	from	om Mi	LAST CHA	RCOAL. Ores	24·00 (28·00 (25°0
No.	1 F dry	from	cold in Hang	BLAST CHA ging Rock nessee Ore	RCOAL. Ores	24·00 (28·00 (25·0 25·0 2 40·0 2 30·0

ST. LOUIS.

Messrs. Spooner & Collins, Iron commission agents, 409 North Third street, St. Louis, under date of June 29, report the Iron market as follows: We have nothing new to report regarding our market slice last letter. Iron has been unusually dall the next reach. garding our market since last letter. Iton has been unusually dull the past week, politics ruing the day. The Democratic Convention having demoralized all business transactions, Tilden and Hendricks stock selling much freer than Charcoal or Stone-coal Pig Iron.

Mo. Stone Coal, No. 1 F'dry. \$25.00 @ 26.00—4 mos.

"" Gray Mill... 23.00 @ 23.00—4 mos.

Gray Mill 22 00 (2) 23 00-4 mc
" Charcoal, No. 1 F'dry 23'00 @ 24'00-4 mo
14 No. 2 F'dry 22'00 @ 23'00-4 mo
44 44 No. 2 F'dry 22 00 @ 23 00 4 mo
Tenn. Charcoal No. 1 F'drv 23'00 @ 24'00-4 mo
11 14 No. 2 F'dev 92-00 @ 93-00 4 mo
" Gray Mill 21 00 @ 22 00 4 mo
Tenn. & H. R. Coke Iron No. 1
F'dry 25.00 @ 26.00-4 mo
Tenn. & H. R. Coke Iron No. 2
F'dry 23.00 @ 24.00-4 mo
Tenn. & H. R. Coke Iron Gray
Mill 22 00 @ 23 00 —4 mc
H. R. Charcoal No. 1 F'dry. 25'00 @ 26'00-4 mo
H. R. '' No. 2 F'dry 24'00 @ 25'00—4 mo H. R. '' Gray Mill 24'00 @ 25'00—4 mo
H. R. " Gray Mill 24:00 @, 25:00-4 mo
Massillon Iron. No. 1 29'00 @ 31'00-4 mo
S. Ohio Am. Scotch 24.00 @ 26.00 - 4 mo
Mo. Charcoal Blooms 50.00 @ 60.00-4 mo
" Scrap " 45'00 @ 50'00-4 mo
Mo. Charcoal Hammered
Billets 75 00 @ 80 00-4 mo
Assorted Bar Iron @ 2% rates.
No. 1 Wrought Scrap 90 @
Heavy Cast " 65 @ Light Cast " 45 @
Light Cast " 45 @

CINCINNATI.

Mesers, L. R. HULL & Co., under date of Mesers, L. R. HULL & Co., under date of July 1, write us as follows: Pig Inox.—During the past week no new features have been developed, nor any indications upon which may be based any reasonable anticipations of an important change soon. The inside quotations below are best representatives of actual sales, and on some brands a little less would be accepted, delivered at landing. The volume of business transacted is estimated about the same as last, with perhaps some improvement.

as met,	WILI	реги	aps i	ome	impro	уещент.	
			CHA	BCOA	L		
Hanging		No.	1	ton.	\$24.00	@25-00 -4	
44 -	9.6	No.	2		28.00	@ -	mos.
66	6.6	For	ge		21.00	@ 22-00-4	mos.
Southern	Bran						mos.
	0.6						mos.
Virginia.						@ 24-00-4	
24	No. 2				22.00	@ -4	mos.
64	Porm				91:00		mos

		STO?	CE C	OAS	AB	D	COKE			
CP.	Rock	No.	1	19	ton	. 8	55.00	0	23.00-4	mos
	11.6	For	ge.				50.00	0	21:00-4	mos
0	rt No.								27:0.1-4	
	For	ge					23.00	(1)	24.00-4	mos
0	tch, N	0. 1.					54.00	0	25 004	mos

Am. Scotch, N	0. 1			54.00	0	25 004	mos,
	CC	LD B	LAST				
Hanging Rock Missouri Southern Br'ds Machinery and	56 6			30.00	0	40°00-4 40°00-4	mos.

Hanging

CHATTANOOGA.

Mr. 8. B. Lowe, under date of July 1, reports as follows: There has been an increased inquiry in the last few days for Wrought Scrap, Horlers are yet firm, seven-eighths was offered f. o. b. for one lot of about 225 tons, but declined. Other than this there is no change to note, either in piece or movements.

COKE.

e g y	No. 1 Foundry 19:50 @ 21:00 No. 2 Foundry 18:00 @ 19:00 No. 1 and 2 Forge 15:50 @ 17:00 White and Mottled 14:50 @
e	HOT BLAST CHARCOAL,
t s	No. 1 Foundry, extra \$21 00 @ \$5 00 No. 1 Foundry 19 5 @ 21 00 No. 2 Foundry 17 00 @ 19 00 No. 1 and 2 Forge 11430 @ 17 00 White and Mottled 15 00 @ 15 00
y	COLD BLAST CHARCOAL.
0	Car Wheel Metal. \$23:00 @ 27:50 Forge Metal. 18:00 @ 20:00 No. 1 Wrought Scrap per Jb., \$4c. @ No. 2 Wrought Scrap
f e t	Cast Scrap, Heavy. per ton, \$12.00 @ 14.00 Cast Scrap, Light. 8.00 @ 12.00 Old Car Wheels. 17.0 @ Old Rails. 18.00 @ 21.50
	-

RICHMOND.

ces, which have been cut to such an extent that the margin for profit is small.

Steel Rails.—No late sales reported, and prices are quoted at \$58 @ \$60 per ton, cash.

The Edgar Thomson Company started a shipment of some 2600 tons by river last week to July 3. Charcon lives as affected by the holiday season, in addition to the usual duliness of July. Quotations as before.

0	Virginia	cold blast C	harco	al Pig Irons		
- 1	(accord	ling to bran	1)		\$28.00 @	35.00
1-		hot blast Cl			24.00	
e-		ling to bran				
	va. not	olast Coke P	ig iro		24.00 @ 22.00 @	
	66 46	4.6	64	No. 3 ex.		
r	Virginia	Anthracite.	No. 1			
t	54	44	No. 2	ex	23.00 @	24:00
	1.6	8.6	No. 3	ex	21.00 @	55.00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels).

PARIS, June 18. 1876.—Metale.—The general state of business is still highly unsatisfactory. A spirit of retrenchment seems to have seized upon the minds of consumers at large, and, although the retail dealers are conceeded not to hold large stocks, they show very little inclination to replanish supplies. The larger dealers follow their example, and the consequence is that producers and importers are bliged to go into store with what they accumulate, there being no speculative demand. A favorable statistical position is, under these circumstances, of comparatively little importance, and the value of metals tends downward, despite an easy money market. Copper.—Extreme quiet is the characteristic of the European markets, and the effect of a moderate visible supply is thus neutralized. The market is decliung here, and we now quote as follows, deliverable at Havre: Chili Bars, 205 francs; Common ditto, 200; Ingots, 210; Tough Cake, 212:50; and pure Corocoro Ore, 210. There is absolutely nothing doing at Havre, and prices are altogether nominal, as follows: First brands Chili Bars, 203: Good Current ditto, 210 to 202:50; and Lota and Urmeneta, 198-75 to 200. Marseilles is in a listless attitude: Bed Tokar, 195; Small Refined Ingots, 210; Bolts, 250; Sheathing, 240, and Yellow Metal ditto, 210 to 220, less three per cent. for cash. Tin.—It is not easy to effect sales in the present mood of the market, either in England or on the Continent, and, notwithstanding the reduced shipments from the East, the tendency remains a drooping one. In consequence of this stagnation, we have decined 12 francs and 15 centimes, and now quote Banca, deliverable at Havre or Rouen, 2:0. Banca Tin has declined at Marseilles to 210 francs, English of 208, and Straits and Bilhton to 200. Lead.—Notwithstanding the refused shipments from the East, the tendency remains a drooping one. In consequence of this stagnation, we have decined 12 francs and 15 centimes, and now quote Banca, deliverable at Havre or Rouen, 2:0. Banca Tin has declined at Ma

BELGIUM.

(Revue Universelle).

Brussells, June 18, 1876.—Iron.—There is no change of note observable in the Belgian Iron marmet, in which large orders are not frequent, while small ones continue to drop in with the utmost regularity. On the Russian railways, especially on the Nicholas line, various wooden bridges are to be replaced by Iron ones to the amount of 2 700,000 roubles. We hope that Belgian industry will have a share in furnishing the same. The new marine constructions at Antwerp, projected by the government, necessitate an amount of Iron of between 40,000,000 francs and 50,000,000 francs, and the lowest tenders submitted have been those of a Belgian firm, beating another Belgian bid, one Australian and one French. (Revue Universell

GERMANY. (Rorsenhalle).

GERMANY.

(Borsenhalle).

Hamburgh, June 17, 1876.—Metals.—A dull state of affairs now begins to spread over the German-Metal market, msinily due to the approaching summer season. Other causes are, however, in operation intensifying the prevailing parsly-zation. Among these we would mention the prostrate condition of German industry, the timolity shown by large operators, and the doubts which overhang the political atmosphere. However easy money may be capitalist show little readiness to invest in anything which cannot be reconverted into ready cash at short notice. Copper has remained uniformly quiet. Berlin quotes good qualities of Euglish and Australian, 87 to 89 marks, the 50 kilos. There is no change here, and we continue to quote Drontheim, 90; Minnesota, 109; Quincy, 97, and English Best Selected, 85 to 88. Th.—There is plenty of offers, but no buyers; we are altogether nominal here. But no buyers; we are altogether nominal here. It was a selected, 85 to 88. Th.—There is plenty of offers, but no buyers; in unaltered. Lead.—Our markets have relapsed into quietness, without as yet showing any positive decline. Berlin quotes Tarnowltz, Hartz and Saxonian, 22 to 22 25 marks; here, German commands 22 to 22 50; and English Pig, 24 to 24 50; ditto Sheet, 34 30 to 25. Speller.—Although the metal is sustained, transactions therein have sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 23; Select, 44. At Bersiau a future sain is quoted. 20; Select.—Although the metal is sustained, transactions therein have been made at 21 709; the nominal quotation here is

(Koch & Vaerboom).

ROTTERDAM, June 20, 1876.—Tin.—The market has been gaining in firmness. Banca, deliverable from the coming July sales has been done at 46 guilders; Billiton, on the spot has brought 43 to 43%, while to arrive it has from 43%, successfully reached 43% and 44.

AUSTRALIA.

(Methourne Arquis.)

Melbourne, April 18, 1876.—Tin.—I fully confirm my previous remarks r litue to the Tin ore discovered in Tasmania. I now add further information as to the progress made since my last communication, not only in Tasmania, but in other parts on this side of the globe. First, I would observe that discoveres are frequently made in the localities known as the Mount Cameron and Riogaroowa districts, as well as in other parts of the island. Both Tin and Bismuth ores have been discovered at Mount Rumsey, but I am not awars that any of these discoveries have been sufficiently tested to enable anyone to speak in positive terms as to its commercial importance; but there can be but little doubt that when the roads are in better condition, and the tramway completed to Mount Bischoff, not only valuable discoveries will be made in the surrounding country but the facility of sending the produce of the mines to market will be far greater than at present. Not olv is alluvial Tin frequently found to contain fine particles of free gold with it, but Mr. Wm. Berkshire has discovered that the Tin ore known is the ruby Tin contains a small quantity of gold chemically combined with the oxide of Tin, which is in all probability the coloring matter of that ore. It must be understood that the quantity of gold is far too trilling to pay for extracting. The Mount Bischoff Company have smelted and shipped 29 tons of Tin since July 1st, but the furnaces were not kept in full work, for want of ore, caused partly by the scarcity of water to wash it. This company are making steady progress, and very prudently depend more on the real merits of their property than they do in issuing highly colored reports.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

> (From our Regular Correspondent.) SHEFFIELD, Eng., June 20, 1876. THE EASTERN QUESTION

is still upon us, and, therefore, "still we are not We are beginning to cherish the conviction that it would be better to scratch out Turkey from the map of Europe, and divide the country between Greece and the Principalities, rather than that these recurrent murders and plots should periodically turn up at mopportune moments. Most of us are willing to admit that Turkey is all very well—with suitable garnishings, at Christmas, but we decided ly object to such bloodthirsty doings in this hottest of weather. The Turks appear to have adopted "Mister" Othello's cry, and are eager for blo-lood-ah-blood, too, on a large scale. What the effect of the two assassinations (just reported in detail by the papers here), may be, yet remains to be seen, but at the time of this writing everything appears mysteriously uncertain.

THE STATE OF TRADE

taken as an entity from one extremity of the kingdom to the other-from John O'Groats to the Land's End; from the North Foreland to the boundaries of Anglesea-is about as bad as it can possibly be. The iron and hardware industries are most indifferently engaged, particularly at and near Sheffield, whilst in the Lancashire cotton mills and factories half-time is the rule rather than the exception. In every department of our great commercial ramifications the same complaint is heard. Go where one will there are lamentations, weeping, wailing and guashing of teeth (metaphorically speaking) at the serious nature of the depression. There is, further than this, no apparent prospect of any improvement at an early date. Nobody has any idea where orders are to be had, or whether there are really any held in reserve by the merchants. Some people despair, and go about uttering piteous jeremiads, others swear and invite the sternest exactions of un pitying fate, whilst open, sensible people here and there, keep "pegging away" with exemplary patience, awaiting the turn of the tide.

MORE HEAVY FAILURES.

MORE HEAVY FAILURES.

The hard times are beginning to tell, and the Gradgrinds amongst us will presently be in a position to prove to demonstration the exact sum and specific quantity of human misery and commercial loss sustained in a given period by a certain number of people inhabiting a carefully estimated area of the country. The "hands" suffer quietly and let the cutside world see very little indeed of their torture, but when the "master" is in trouble, the public witness his struggles and commiscratingly world see very little indeed of their torture, but when the "master" is in trouble, the public witness his struggles and commiseratingly pull him through. A couple of instances in point have been publicly recorded within the past week. In one case a meeting of the creditors of Sir E. Buckley, M. P., was held at Marchester, the liabilities being put down at 250,000 and the assets at £145,000. The losses in this instance were said to have arisen from stock exchange transactions;" but the meeting ended in the usual placid way. Had it been a small shop keeper, who had lost his money by betting on horses (a by no means worse pursuit than stock and share gambling), the creditors would doubtless have been very severely moral in their remarks. In the other case the bankrupt is Mr. John Henry Garbutt, of London and Darlington, &c., iron merchant and coal owner, whose liabilities are stated to be about £170,000, with assets worth some £50,000. This estate is also to be "liquidated" in a comfortable and respectable manner, after which business will probably be "carried on as usual."

TERRIBLE FIRES.

Fires almost always appear to be epidemic. No single large fire takes place. There has no sooner been one "big" "fire in one town than the news arrives of a bigger one elsewhere. Such was the case last week. On the Thursday evening of last week Brook's Wharf, Upper Thames street, London, was destroyed with its valuable contents. One floor alone of the bonded warehouse contained 40,000 chests of the from the tonded warehouse contained 40,000 chests of the bonded warehouse contained 40,000 chests of the cultery mandacturers being still laid off. In the dight of the cultery mandacturers being still laid off. In the lighter's valuable contents. One floor alone of the bonded warehouse contained 40,000 chests of the cultery mandacturers being still laid off. In the lighter's valuable contents. One floor alone of the bonded warehouse contained 40,000 chests of the cultery mandacturers being still laid off. In the lighter's valuable contents. One floor alone of the bonded warehouse contained 40,000 chests of the cultery mandacturers being still laid off. In the lighter's valuable contents. One floor of the bonded warehouse contained 40,000 chests of the cultery mandacturers being still laid off. In the cultery floor of the cultery mandacturers being still laid off. In the cultery floor of the cultery mandacturers being still laid off. In the cultery floor of the cultery mandacturers being s

and often so awfully devastating, seeing that the mills are filled with wool, cotton, flux or other goods which get oily in the course of being manufactured, and so combine to form is determined to adopt a thoroughly protectionand often so awfully devastating, seeing that the mills are filled with wool, cotton, flax or other goods which get oily in the course of being manufactured, and so combine to form a huge bonfire ready for the awakening spark or the slow match of spontaneous combustion. Until more iron is used in mill buildings they will not and cannot be safe.

will not and cannot be safe.

A MUNIFICENT MANUFACTURER.

Mr. C. F. Beyer, who has recently died has left £100,000 to Owen's College, Manchester; £10,000 to the Manchester Infirmary; £10,000 to the Manchester Grammar School, and £10,000 for a new church at Gortan, near Manchester, Mr. Beyer was the senior partner of the famous locomotive makers, Beyer, Peacock & Co., of Gorton Engineering Works, Lancashire. The firm has probably built more engines than any other house in the whole world.

ANOTHER "LARGEST BRIDGE IN THE WORLD."

ANOTHER " LARGEST BRIDGE IN THE WORLD." ANOTHER "LARGEST BRIDGE IN THE WORLD."

All the new bridges opened now-a-days are the "biggest bridges in the world." The latest one, however, is modest enough not to lay claim to being the longest, or widest, or highest, or strongest structure of its kind, but asserts itself to be the heaviest swing bridge in the world, the swing weight being 1500 tons, and the length of the swing span 278 ft. 6 in. It has just been completed over the Tyne at Noweastle.

COAL IN CHINA.

Somebody is trying to give us a fresh fright about that Heathen Chinee. This time Johnny is held up to us as a "frightful example" in the way of coal, and the narrator pelts us with statistics to show that China has twenty times the coal area we have, and consequently will some day or other supply our descendants. May they be enabled to cheat each other successions. safully! Meantime the figures (and a few sily pronounced names of the districts) are

Chih-li, Shant	ung,	and So	uthern Man	Square chria	84,000
Szchuen					70,000
Kian-si					35,000
Shan-si					30,00C
Fuh-kien					25,000
Shen-si					25,000
Kwang-tung.					23,000
Hunan					21,000
Kiang-su					20,000
Yu-Nan					20,000
Kwei-Chow.					14,00J
Kwang-si					13,000
Ho-Nan					10,009
Cheh-Kiang					6 000
Hupeh					5,000
Ngan-Whui					4,000
Kiang-Su					4,000
Mang-Su					
T	otal				109 000
Professor	Ans	tead's	estimate	of the	coal-

Professo fields of F									ľ	8		-	9.9	31	ti	E	n	a	it	e		0	Í			t	h	e	-		cc	180	1
British Isla			^																				200	0	ı	1	a.	re	e	I	ni	le	g c
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Spaln						*			. ,									K .			. *		ĸ	,				. ,			4,	00	H
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Bohemia			۰				0										0			0		0		۰		,					1,	00	X
	T	ot	al	١.					*					. ,															200	20	,0	7:	2(
			5	8(30)'	Г	C	В	1	I	2)	10	¥		D	R	C	2	ř													

scorch Pig Iron
does not appear to be particularly lively just
now. Indeed, since I last wrote the market has
been almost stationary, with a tendency, however, toward lower prices. The shipments are
on a fairly good scale, yet business cannot be
said to be other than quiet. From Glasgow,
last week, there were shipped engines, machinery, bridge work and other manufactured iron,
worth about £40,000. Freights for pig iron are
unchanged. unchanged.

unchanged.
Writing on June 16, James Watson & Co. said:
"During this week there has been little variation in price of warrants. O. Monday the opening figure was 57/7½, from which the market advanced to 57/1½, but has since receded to 57/7½, closing sellers thereat for cash. Suipments hast week were 10,830 tons, against 11,625 tons in the corresponding week of 1875."

G. M. B., at Glasgow 58/ 55. Garteherric, 65/ 58/ Coltness, 69/ 58/ Summerlee, 62/ 57/ Langloan, 67/6 57/	We quote:			-	No. 1.	No. 8.
Gartsherrie 65 58 Coltness 69 58 Summerlee 62/ 57/ Langloan 67/6 57/ Carnbroe 60/ 57/ Cal.:cr, at Port Dundas 65/6 58/ Glengarnock, at Ardrossau 63/6 58/ Eginton 57/6 56/ Notts, at Leith 68/ 59/	G. M. B., at	Glasgo	w			25.6
Summerlee, 62/ 57/ Langloan, 67/6 57/ Carnbroe, 66/ 57/ Carloroe, 66/ 57/ Cal.:cr, at Port Dundas 65/6 58/ Glengarnock, at Ardrossan 63/6 58/ Eginton, 57/6 56/ Dalmellington 57/6 56/ Shotts, at Leith 68/ 59/		44			65/	58/
Summerrec,	Coltness,			 	69/	58/
Langroan, 97/5 Carnbroe, 66/ Cal.:er, at Port Dundas 65/6 Glengarnock, at Ardrossan 63/6 Eginton, 57/6 Dalmellington 57/6 Shotts, at Leith 68/ 59/9	Summerlee,			 	62/	57/6
Cal.:cr. at Port Dundas 55/6 58/ Glengarnock, at Ardrossan 63/6 58/ Eginton, 57/6 56/ Dalmellington, 457/6 56/ Shotts, at Leith 68/ 59/	Langloan,			 	67/6	57/6
Glengarnock, at Ardrossan						57/6
Eglinton, 4 57/6 56/ Dalmellington, 4 57/6 56/ Snotts, at Leith. 68/ 59/						
Dalmellington, 48		, at Arc	irossan	 		
Shotts, at Leith		4.5		 		
		M.				
Kinneil at Boness						
	Kinneil at E	oness.		 	59/6	55/6

Estation of Messrs. William Colvin & Co. and John E. Swan & Bros. (limited) are to the same effect, so that it would be useless to give them here.

OUR MARITIME DEFENCES.

Captain Scott, whose forte, figuratively speaking, has hitherto been regarded as heavy navalus as a "bogey," but he tells us so many things of a depressing nature that our spirits drop down to zero in spite of ourselves. In lecturing last week, at the United States Institution, in London, the gallant captain said: "The loss of the Captain and Vanguard showed we lacked the first condition of defense—unsinkable ships. Few ships are armed with the most formidated be offensive weapon—the ram. We had a few heavy guns, and, though we had constructed 80 ton guns, no 38 ton had been tested to a hundred rounds. An 18 ton will penetrate the thickest armor afloat, yet only Hercules and Brazilians. We had under 20,000 naval seaman, and no reserve worthy of the name. 'Having the last like horse to the teaps the last part of the captain held out correction to the teaps of the Captain held out correction to the part of the captain held out correction to the part of the captain held out correction to the captain held out correction. Brazilians. We had under 20,000 naval seaman, and no reserve worthy of the name." Having thus played Cassandra, the Captain held out some little hope, in the shape of his own remedies, one of which was that "swift cruisers should keep the seas, communicating (with each other or the shore?) by light telegraph cables which might be buoyed!" I am afraid the gallant captain was at sea, when he suggested that.

to all appearance the government of the Czar is determined to adopt a thoroughly protectionist policy.

In this connection I may mention that 365 tons of hammered and rolled Russian bar iron were offered by suction here on Tuesday, but only 110 tons of rolled bars were sold at £10, 15/per ton. This fact illustrates the dullness of the local file and saw trades in which these irons are largely used. At a meeting of the principal local manufacturers of railway springs held here on Friday last, it was determined to make an early reduction in the wages of the spring smiths, the meeting being adjourned for the purpose of settling the precise amount of the intended reduction. At present the men receive 2/9 per cwt, for fitting wagon bearing springs, and 3 3 per cwt, for buffer, engine and carriage springs. There are about 650 men in this branch here, and they aiready threaten a resistance. The state of trade, however, hardly warrants them in thinking they could offer a successful opposition.

The ordinary iron works are badly employed, and merchant iron is almost wholly neglected; in fact, people broadly state that there is no business doing in the trade at all. In the edge tool industry matters are uneven. Most of the manufacturers are very midifferently engaged, whilst one of the leading houses is actually greatly in arrears with the execution of orders in one especial section—not less than three years behind hand. This, of course, is altogether exceptional.

BIRMINGHAM AND STAFFORDSHIRE.

BIRMINGHAM AND STAFFORDSHIRE.

BIRMINGHAM AND STAFFORDSHITE.

There has been no special change in the condition of the South Staffordshire iron trade during the week. A few of the sheet manufacturers are rather busier, orders for about 1500 tons of singles having been given out to five of them by an enterprising man of their own order, who thinks be can buy to advantage just now rather than make. There are plenty of yood bars to be had at under £9 per ton, and it is believed that the few sales of best bars now taking place are being doue at lower than the list. £9 to £9.10/. In the hardware branches matters are quiet, the export demand being still almost nil. The home trade in implements and sundry sorts of builders' goods, tinware, &c., is very steady just now, under the influence of fine weather, good harvest prospects and the beginning of the seaside season.

SOUTH WALES AND MONMOUTHSHIRE.

beginning of the seaside season.

SOUTH WALES AND MONMOUTHSHIRE.
During the past week 60,194 tons of steam coal have been shipped from Cardiff to foreign ports, beside 2323 tons of rails, 80 tons of copper and 2133 tons of patent fuel. The whole of the iron, steel and tin plate works remain badly engaged, with the exception of Ebbw Vale and Dowlais. At the latter place rails are being made for stock, and it is said that another rail mill is to be erected presently. Penydarran Works are also likely to come into the possession of the Dowlais proprietary. Steel rails, I may say, are not much over £7 per ton at the Welsh works.

THE METAL MARKETS

Welsh works.

THE METAL MARKETS

are still dull, and some quotations are lower. At Birmingham there have been few sales, and copper is £1 lower. At Sheffield there have been few transactions, also, owing to the quiet condition of the plating industries.

Von Dadelszen & North's weekly report runs thus: "Copper very dull and lower. Chili bars on the spot have been sold at £76, 10 / for g. o. b., and £76, 15 / to £77, 5 / for named brands; £76 would be taken for g. o. b. delivery in three months. Stocks have increased considerably during the past fourteen days, and much disappointment has been expressed at the loss of a large running contract for cartridges (about 800 tons copper) which has been taken by America. Australian copper very flat, Wallaroo and Burra quoted £81. English smelters have reduced their official quotation £2 per ton. We quote tough £82, 10 / to £83; sheets, £88 to £89. Tin steady. A fair business done in Straits and Australian both on the spot and for forward delivery at £74. In Holland; or £71, 10 / per ton in London. English ingot, £79. Bars, £80. Tin Plates very dull. Lead easier, at £21 to £21. 5 / for English and £20. 10 / for Spanish. Spelter quoted at £23. 10 / for Sileslau. Quicksilver, at £8, 17, 6 to £9 per bottle."

The Mining Journal's remarks are of a similar purport.

Mesers. Harrington, Horan & Co. (Liverpool,

	MAX		
Chill home	To Day.		, 1875.
Chili bars	£16, 10 to £7	8 £82, 10	10 £84
ingots	284	£3	90
ore and			
regulus.	15/ to 15/6	16/6 to	17 136
Coro Coro Ba-			
rilla	17/6	18	6
J	une 15, 1874.	June 13	1879
Chili bars	£78 to £81		£84/10
" ingots	288	400 (0)	
" ore and	8600		10
regulus.	15/8 to 15/6	9.00 (4)	4- 40 0
Coro Coro Ba-	10/0 10 10/0	19.0	to 16 6
rilla	16.3		
			17/
ARRIVALS HERE I	URING THE I	PORTNIGHT OF	WEST

Stocks of first and second we estimate	nd hands,	ilian a likely	nd Bol to be	ivian) in available,
Ores	Regulus.	Bare,	Ingote	
Liverpool Swansea114	2359	7724 2736	398	10

Copper in ores	1874. Tons. 2,816	1875. Tons. 2,409	1876. Tons, 3,741
Bars, cake and ingots	4,725	7,750 19,658	6,240 15,434
In pyrites, estimated	5,923	5,845 85,665	6,895 31,810
EXPO		30,000	oaqoa o
English copper—wrought and unwrought Foreign copper—unwro't Yellow metal	8,240 9,905 5,834	8,768 5,631 5,603	9,185 6,465 5,111
	00.020	10.000	90 791

According to advices from Valparaiso the According to advices from variants the comparative exports of fine copper from Chili and Bolivia to all parts of the world during the first three months of the following years were: 1876. 1875. 1871. 1873. 1872. 1871. 1870. Tons. Tons. Tons. Tons. Tons. Tons. Tons. 13,488 12,324 12,289 8,563 12,163 10,171 14,370

13,485 12,534 12,287 3,000 14,100 14, 100 % 100 % 100 % 100 % 1872, 1871, 1970, 70·37 × 60·676 × 56·96 × 40·86 × 1·93 × 5·035 × 3·18 ×

Tin.—Market quiet at £74 for Straits and Australian, £78 for British, and £62 to £65 for

Australian, £6 for Bitton, and Peruvian.

Lead.—Market dull at £21. 5/ to £21. 10/ for ordinary shipping brands, and £20. 10/ for Spanish without silver.

Spelter.—Market dull at £23. 5/ to £23. 15/ for ordinary Silesian Brands.

Stove Exhibits at the Centennial.

THOMAS, ROBERTS, STEVENSON & CO., Philadelphia, make a nice exhibit of stoves, prominent among which we may name the "Times." which was awarded the gold medal at the Louisiana State Fair, 1873. The manufacturers, in bringing out this stove, have exercised special care to produce an article that will meet the requirements of the public in all respects, and the large sales show how complotely successful they have been in the undertaking. This stove is provided with improved double acting flues, which gives it a very quick and powerful draft, while at the same time it is so closely fitted that the fire can be controlled with perfect ease. Its proportions are very symmetrical, and the adornments in good taste. while for convenience in its cooking arrangements it is all that can be desired. The "Harvest Home Cook" is another useful and neat looking stove, said to be an excellent baking stove, and particularly economical in its fuel requirements, and is suitable for coal or wood. The manufacturers say they mean to sell it as cheap as the inferior make of stoves, and give a guarantee of entire satisfaction. They also exhibit the "Commander Range," with six holes, the "Champion Range," with five holes, and the "Parlor Cabi net Range," and claim to have a combination of all the latest improvements in each of these ranges, with the addition of dust flue, operated by top damper, nickel-plated knobs, illuminating doors, broiler and feeder door, end shelf or plate warmer, etc., etc., and with water-backs to Nos. 7 and 8. Finally, we must mention the Phoenix Portable Furnace," which has had a large sale, and we believe has given entire satisfaction wherever it has been introduced. Its peculiar construction gives it a large amount of radiating surface, the lower drum, consisting of outer shell of heavy wrought iron with heavy cast iron heads, containing nine to ten hot-air tubes. The cold air enters the bottom of these tubes, and passes out at the top hot, from thence to hot-air pipes. The upper or hot-air drum, into which the smoke passes after leaving the tubular drum, and carried entirely around it by a check before its exit to the smoke aue, is one of the most commendable features of this furnace, for which letters patent were granted February, 1874. All the cook stoves made by this firm are provided with the patent corrugated bar grate (patented April 25. 1876), making a more durable grate than the straight bar, as it resists contraction and expansion without bursting; is also more easily raked, and gives the stove a better draft.

Nos. 117 and 119 South Tenth street, Philadelphia, make a display of gas stoves, which are attracting a good deal of attention, and which, we are informed, have been universally approved, after a fair trial, general features here. for a variety of purposes. For heating purposes they have three sizes. They are very convenient York. for taking the chill from bedrooms and they require no chimney flue, and make no smoke, dust or ashes. For temporary heating purposes they are cheaper than any other fuel, as the gas can be shut off instantly when no longer required, and there is no trouble in providing fire or handling. The gas cooking stove, however, is the main attraction at this season, as it enables housekeepers to do their regular cooking, baking, &c., during the warm months at less expense than with coal or wood fuel, with less trouble, and, at the same time, keeping the house cool and comfortable. The manufacturers claim be expected of any ordinary cook stove; will heat irons, boil, roast, broil, stew or fry, and, used with large oven, will be found an excellent baker. The firm also exhibits their nursery gas stoves, table gas stove, and a most useful for fifty cents, and works perfectly over any ordinary gas burner. It is intended for nursery purposes, heating shaving water, making coffee, tea, gruel ; will accommodate any size vesburns with a blue flame, and does not smoke the brightest tinware. The exhibit is a very interesting one, and the claims put forth by names as reference.

CHAS. BURNHAM & CO.,

The Water Supply of New York. The rapid extension of the area of certain

great cities creates an important engineering

difficulty, the dimensions of which grow as

rapidly as the cities themselves. The difficulty lies in providing the inhabitants with a sufficient supply of pure water, and there are only two methods of dealing with it. One consists in introducing additional quantities of water as new streets are built, the other lies in inducing the inhabitants to place some moderate restric tion on the use, or, more properly speaking, the abuse, of water. In Great Britain it becomes more difficult every day to obtain really good water in the enormous quantities required for such cities as London or Liverpool; and various expedients are adopted to compel economy in the use of the liquid. One consists in supplying water for only a limited period in the day. This is the system employed by the London water companies, but it is open to many and grave objections which we shall not stop here to explain. Another device consists in compelling householders and other users of water to adopt specially contrived fittings to prevent waste. A given quantity of water can be drawn at one time and no more until reasonable interval has elapsed; and even if a tap were left open, no water could run to waste except a gallon or so. "Waste water preventors," as they are called, are now extensively used in London houses. Where the constant supply system is adopted, what is known as the "needle" ferrule has met with some favor. This ferrule is simply an expedient by which the service pipe to a house is so contracted in area that but s moderate quantity of water can pass; it is, and justly so, an extremely unpopular device. It is not necessary to say more here on these matters than will just suffice to refresh the memories of our readers concerning points of vital importance to the well-being of the population of towns and cities. In England, as we have stated, it has become so difficult to obtain large volumes of pure water at a moderate outlay that much attention is devoted to economizing water. For many years past we have pointed exultingly to the magnificent Croton aqueduct by which a torrent of water is poured daily into New York. Economy was a thing to which we gave no thought. New York, however, has Lest it should be assumed that the not stood still, and a feeling of growing uneasiness has for some time found a home in the breasts of competent and intelligent American engineers. Fears have been expressed that the Croton aqueduct would not always suffice to supply the wants of New York, and that a time must come when very large sums would have to be expended in introducing a further supply. But there is always a period in the history of cities during which, although the inhabitants want more water, they do not want it enough to spend large sums in obtaining a further supply; and this epoch appears to be very nearly reached in subject as yet, but the attention which has been given to such questions, when taken in connection with certain statements made from time to time in influential professional circles, all go to show that the Croton Aqueduct is no longer regarded as being all that New York can require as a means of water supply. The first definite authoritive note of warning was given by Mr. Benjamin S. Church in a paper on the Croton Water Works, read before the American Society of Engineers, last February. Mr. Church evidently speaks with a full knowledge of his subject; and although he disclaims all intention of underrating the qualities of the Croton squeduct, the picture which he furnished of its present condition can hardly fail to excite apprehension. His statements go to show that the aqueduct can barely convey all the water that New York now requires; that it is almost totally inadequate to meet any increasing demand on its powers, and that it is in such a condition that incessant attention is requisite to avoid a catastrophe by which New York might be left almost entirely without water for a considerable period. As the Croton aqueduct has been looked upon as a model of its kind, Mr. Church has done good service in pointing out in what its defects lie, so that they may be avoided in future.

The Croton aqueduct has so often been described that we need say little concerning its It is a brick tunnel over These stoves are of various sizes, and adapted 40 miles long, establishing a communication between a great reservoir at Croton and New The water supply is practically unlimited; but New York can nevertheless obtain no more than the aqueduct will convey. The gradient to which the latter is laid is extremely moderate, being only on an average a little less than 14 in. to the mile, with certain exceptions. Thus there is a length of 5 miles from Croton dam, in which the fall is but 7 in. to the mile, and from Manhattan Valley to the reservoir in Central Park-into which the aqueduct discharges-the fall is but 9 in. to the mile. Great lengths of the aqueduct are laid underground, but there are no fewer than 125 embankments from 180 ft. to 14,000 ft. in length, and from 10 ft. to 40 ft. high. The aggregate length of that the stoves will do any work reasonably to these embankments is about 5 miles. The aqueduct consists in cross section of two vertical side walls covered above with a true semi-circular arch, and united below by a segment of a much flatter arch. In making the embankment rubble stone foundations were first built withlittle article called the gas Ætna, which is sold cut any mortar, about twice as wide as the tunnel. On the top of the rubble was laid a foot of hydraulic concrete, and on this the tunnel was built of masonry and lined with brick. Earth was then piled up at each side, sel from a small tin cup to a medium coffee-pot, and over the top of the rubble embankment and the tunnel, to keep out frost, and the slopes of the earth have been revetted with stones. It would appear that the walls of the the manufacturers are endorsed by many of our culvert, or tunnel proper, are now, and always most prominent citizens, who have given their have been, too weak for the pressure within; but so long as no settlement occurred, no

leaks worth consideration opened. Unfortu- aqueduct must be constructed, or some means nately, in the embankments considerable settlements have taken place from time to time. It appears that these settlements continue to ocbankments the aqueduct proper is split longitudmally top and bottom, and leaks have thus been originated. Some of these leaks become so alarming in severe weather that it becomes necessary to shut the water off at Croton, and to empty the entire aqueduct, in order that men may get inside to effect the necessary repairs Now, a very great mistake was committed when the aqueduct was constructed. The builders imagined that they were building forever, and no provision was made for effecting repairs. It is true that manholes are provided intervals, but no cross water gates were fitted, by the aid of which a section convertible into perfectly transparent glass of might be emptied, leaving the remainder of the aqueduct full; and thus it happens that of whenever a leak occurs, be it near the upper or of the heat it contains when thus taken direct the lower end, the entire aqueduct must be from the furnace in its liquid state, so large a emptied. This is necessitated from the fact. that waste gate ponds, six or eight miles apart, are not provided with cross gates to enable the water to be stopped at that point and turned out. When such a serious leak occurs, as in the case of a certain embankment within a few mil s of High Bridge, it requires 30 hours to rid the aqueduct of water in order to make repairs, and 15 hours more for the water to reach that point after being turned on at Croton, thus making a loss of 45 hours, exclusive of the time spent in making repairs, when three hours would suffice if cross gates were provided.

If the supply were more than sufficient, then this delay would be of little importance, but as in the summer especially the aqueduct can do little more than keep the Central Park reservoir full when working to its maximum capacity, it is clear that a total stoppage of supply for probably three or four days is a very serious matter. Mr. Church states that these repair stoppages may lower the water in the reservoir by as much as 10 ft., and that when this takes place the loss of pressure is sufficient to deprive upper stories of water over a considerable area of the city. Under present conditions, should an immediate succession of repairs become necessary, the reservoirs would be so reduced that the consequences might be disastrous. imperfections of the aqueduct are exaggerated, Mr. Church states that, as it is impossible to cut off the supply for a suffi cient period to enable substantial repairs-equivalent in places to reconstruction-to effected, for some years past the constant supply has been maintained by the following expedients: So soon as a leak occurs, sawdust, fine sand and clay are mixed into a paste, and thrown in above the leak. This composition is carried into the fissures by the currents, when it swells and stops the leak for a time. When some change of temperature or other cause starts the leak again, the process is repeated. New York. Not much has been said on the Increasing vigilance and care have been required on the part of the engineers and their

employes to keep up the supply. The failure of the aqueduct is attributable in some measure to the fact that it is overworked, the pressure within it being too great. Ultimately, a second aqueduct must be constructed, tut at present almost the entire trouble could be avoided if the inhabitants of New York would only consent to regard water as a valuable commodity which must not be wasted. We suppose there is no city on the face of the earth in which so much water is wasted as in New York. The population is about 1,100,000, and the consumption is 114,000,000 of gallons per day, or 103 gallons per head. Probably the minimum allowance for any city is 20 gallons, and twice this should suffice for every conceivable contingency. London, with at least three times as many inhabitants as New York, has but 108,000,000 gallons per day, or about 30 gallons per head, and of this a considerable portion is wasted. The waste of water in New York is something enormous, and apparently proceeds night and day. Mr. Church suggests the use of meters, and the supply to every house of a reasonable quantity of water, say 40 gallons per head, without any but the ordinary charge, but for for every gallon used beyond this standard number, he would exact a price so high that persons would take very good care that no any particular meter.

On this subject we have very decided ideas of our own. We believe that water meters should be required in all stores, public build ings, hotels, warehouses, ferry houses, wharves, manufactories, and wherever else the use of water is attended with advantage or profit. The great waste of water does not occur in dwellings. On the contrary, the housekeeper is, as the rule, a careful conservator of water. and until we have stopped the public waste of water we can afford to leave the bouseholder into private houses, but were the waste in barooms, hotels, wharves, warehouses and public buildings checked, our daily average consumption per head of population would probably be reduced nearly one-balf.

It is probably unnecessary to comment on ers. They are full of warning for every engineer who has to deal with the water supply of towns, and they prove that it is beyond all things essential, when expending considerable sums of money, to provide for a far greater demand than that of the moment. What work is constructed should be thoroughly sound and good, no matter what the cost; and care should be taken to so design mains, sluices and reservoirs that without much trouble the capacity only produced 230 tons of gray Bessemer pig for supply of the works can be largely augmented at a future period. The condition of the water supply of New York is, to say the actly to the quantitity of rail ends added to the least, extremely unsatisfactory. Either a new charge.

must be adopted for preventing waste. We have in this case an example of what may occur when the supply of pure water is unlimited alcur, and Mr. Church states that on all the em- though distant. What would be the ultimate condition of New York if water was scarce as

Glass from Blast Furnace Slag.

We have lately had an opportunity, says Enineering, of examining several specimens of glass manufactured under the patent of Mr. Bashley Britten. The process consists in using the slag from iron furnaces in its liquid state direct from the blast furnace. It is found that the whole of the slag when thus employed is a good color, and thus, by the utilization a material now valueless, as well as bring about most important changes in glass manufacture. The process has been successfully carried out at the iron works of Messrs. Cheshland & Fisher, near Wellingborough, by Mr. Britten on behalf of a number of gentlemen interested in the patent.

The slag is conducted while in a liquid state into a tank holding about 15 cwt., where it is mixed with other materials, and in an incredi- the mercury, and hence its form. This is the bly short space of time, as compared with the

der this patent on an extensive scale.

Progress in Japan .- The rapidity with which the Japanese are assimilating the habits and science of the West is one of the greatest marvels of the age. Civilization until now has always taken the opposite course to that of the sun, and the change going on in these far east ern islands is not mere external imitation. but an absolute internal transformation. few years ago an imperial college of engineer

ing was established in the principal island, with the view of educating native engineers for the Department of Public Works. Admission in obtained by competitive examination, the course of instruction is very complete, and the college is at present under the management of English professors, the English language having apparently been adopted as the scientific tongue. In connection with this institution there are well-fitted laboratories and workshops of various kinds. The special courses are civil and mechanical engineering telegraphy, architecture, practical chemistry and metallurgy. The number of students at the close of the last year waz 272. We are also in formed that energetic measures are being adapted by the government for introducing the improved manufacture of iron into the country With this view, two charcoal blast furnaces and other works are in course of erection, and it is expected that, by the close of the present year, twelve puddling and seven reheating furnaces, forge train, plate, rail and bar guide mills, with steam hammers, four different shears, saws. lathes, cranes and all other necessary appliances of the most modern construction will be in operation.

Corrugated Iron .- Specimens of a new style of corrugated iron for building purposes have been submitted by an Austrian engineer named Pitze, to the Austrian Association of Architects and Engineers. The chief novelty in Pitze's patent is the shape of the corrugations; the walls of each being higher than their waste would take place. The cost of meters he estimates at \$2,000,000; but he does not suggest profile when the corrugated sheet is placed horizontally. This vertical position of the walls of each groove enables the corrugated sheet to bear its maximum load, and thus to fit it for general use in construction. It is being used for roofing in a new building in Vienna at the corner of the Lichtenauergasse.

Blown Cast Iron .- The Moniteur des In terets Materials says that considerable attention has been given of late, in Belgium, to a method for, to some degree, refining cast iron previous to puddling, put in practice by Mr. Fernand alone. As a last recourse meters may be put Hamoir, of Maubeuge. The process consists of submitting the cast iron, at the instant it is tapped from the blast furnace, to a current of air from the same blast that is being supplied to the tuyeres of the furnace itself; the pro cess is very rapid, and the apparatus simple and inexpensive, while the advantage obtained the statements we have placed before our read- is, that the pig iron is so far refined that one charge more per 24 hours can be worked in the puddling furnace.

> Use of Rail Ends in Blast Furnaces. -According to Heyrowsky, it has been found, at Zeltweg, very advantageous to add the crop ends from the rail mill to the charge on the blast furnace, and at present, from this reason, the blast furnace at Zeltweg, which formerly iron per week, now turns out 270, the increase of the forty tons in the make corresponding ex-

Thin Iron .- Some exceedingly thin iron sheets have just been rolled at the works of the Pearson & Knowles Coal and Iron Company, at Warrington. They are stated to be no more than 0.0015 in. thick, and the specimen forwarded to the Mining Journal office is about 2 inches by 11/4 inches, and has but four very small holes in it. The peculiarity is that Mr. Hooper, the energetic manager of the works, rolls the sheets from iron produced, from the pig to the rolled sheets, at the Company's Dallam and Bewsey forges, by a process devised by himself, and which permits of the sheets being rolled several at once, and without sticking. The iron must be of excellent quality to permit of such thin sheets being rolled at all,

A curious little engine, termed an electrocapillary motor, has been described by M. Lippmann. If a globule of mercury be placed in a saucer, together with a little solution of potassium dichromate, acidified with sulphuric acid, saving is effected that the process is likely to and it be touched upon the side with a point of iron, it will at once contract laterally, drawing itself away from the iron. This will break the contact; gravity will spread the globule out again, when it will again touch the iron and contract; and so on. The explanation of this phenomenon is to be found in the fact that the electric current developed on contact of the two metals, changes the capillary constant of action which M. Lippmann has utilized in ordinary method, glass is produced. This glass his motor. In a glass tank filled with is acknowledged by the workmen to be of an diluted sulphuric acid, are two small is acknowledged by the workmen to be of an exceedingly soft or plastic nature. It is perfectly acid proof and capable of use for all purposes for which the best bottle glass is suitable. It cuts readily with the diamond, and is available as rough plate for roofings, skylights, green houses, roofing tiles, and for many other uses from which glass, as heretofore manufactured is, on account of its cost, necessarily shut out. Specimens have also been produced of this glass colored brilliantly, and suitable for the purposes for which colored glass is employed.

A private company has been formed and will shortly be registered with a capital of £200,000 for carrying out the manufacture of glass under this patent on an extensive scale.

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EVERY THURSDAY MORNING

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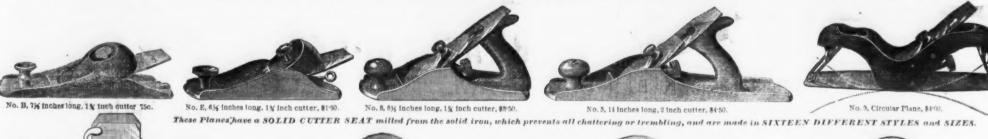
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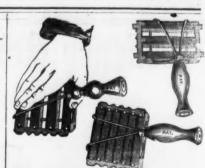


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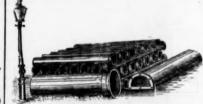
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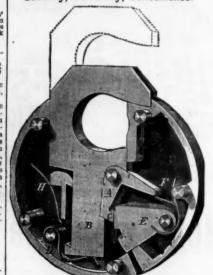


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S. D	Hussey, Binna & Co., Pittsburgh, Pa
ale Lock Mfg. Co., 299 Broadway, N. Y	Shears Scissors &c. Marx Bros. 489 B'way, N. Y
ane Lock Mix. Co., 298 Broad way. N. 1. 2. achiperv. Mixkers of: . Illas & Williams, 167 Pivmouth. Brooklyp	Smeetting Works, Williamsburgh, N. Y. 2 Binn's Smelting Works, Williamsburgh, N. Y. 2 Du-Plaine & Co., 1318 & 1308 Buttonwood, Phila. 41 Hooks Smelting Co., Phila, Pa
lendey Machine Co., Wolcottsville, Ct	Hooks Smelting Co., Phila., Pa
he Hull & Belgen Co., Danbury, Conn.	Sinmped and Japanned Tip Ware. Shepard Sidney & Co., 22, 74 & 76 Lake. Chicago
vetnerili Robert & Co., Chaster, Pa	Steam Flummers, etc., Makers of. Bradley Mig. Co., Syracuse, N. Y. Dudgeon itichard, 24 Columbia, N. Y. 39
boone W. C., '8 Humboldt, Brooklyn, E. D	Dudgeon idehard, 24 Columbia, S. Y
yon & Fellows Mfg. Co., Williamsburg, N. Y	Stafford Mig. Co., 60 Culton, N. 1
nchinistr' Tools, Makers of, Slaisdell P. & Co., Worcester Mass. Asthe & Morse Tool Co., Worcester, Mass. Anning H. S. & Co., 111 Liberty, N. Y. Saiser Louis, 125 Worth, N. Y. San Haagen C. & Co., Phila, Ph	Hold Back and Shap Co., Troy, N. Y. Midaletown Too' Co., 18 & 20 Cliff, N. Y. Springs.
Saiser Louis, 125 Worth, N. Y	llowland Wm. & Harvey, Frankford, Phila
Hardman James Jr., 71 John, N. Y	Steam Pumps, etc., Manufacturers of
iammer & Co., Branford, Ct	Crane Bros. Mig. Co. Unicago, III
arch Safe. Svans Price. 588 Greenwich, N. Y. ensaring Tapes. 5ddy Geo M.& Co., 353 Classon Ave., Brooklyn, N. Y.	Adometer Seam Fump Co. 384 No. Crane Bros. Mrg. Co. Unicago, III. 2 No. Wiley Machine Co., East Hampton, Mass. 35 P. Stenen Traps Albany Steam Trap Co., Albany, N. Y. 38 Miley Harding Co., Steem Trap Co., Albany, N. Y. 38 Miley Castings. Adminification of Co. Steem Co., Co. Co. Co., Co. Co., Co. Co., Co.,
dddy GeoM.& Co., 253 Classon Ave., Brooklyn, N. Y. Allets, N. Y. Handle & Mallet Works, 456 E. Houston	Alloady Steam Frap Co., Alloady, N. 1
cane U. O., 104 John, N. Y.	Crucible Steel Casting Co., Pittsburgh, Pa40 Pittsburgh Steel Casting Co., Pittsburgh, Pa
Graves O. W., 42 Cliff, N. Y. Diegg H. L. Co., US Walnut, Phila.	Steel Importers, Carr J. & Riley, 82 John, N. Y
Purves A. & Son, cor. South and Penn, Phila	Hobson Francis & Son, 97 John, N. Y
Junces J. W., 98 William, N. 1 Surges Frank & Co., 72, 74 & 76 Lake , Thicago Thomson A. A. & Co., 218 Water, N. Y	! tersons & Co., 24 Broadway, N. Y
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etals, Anti-Friction. Baldwin B. W., Pittsburgh, Pa.	Pittsburgh Steel Casting Co., Pittsburgh, Pa.
Saidwin B. W. Pitsburgh, Pa	Chrome Steel Co., Brookivn, E. D
Hayes G., 71 8th ave	Gautter D. G. & Co., Jersey City, N. J
eat Chepping Machine Co., 16 Chambers, N. Y.,	Migrale Steel Works, Micetown, Phila., Pa
hayes G., 718th ave. etail Reofing. Hickcox Mig. Co., 250 Pearl N. Y. ear Chopping Machinery. Balley Wringing Machine Co., 166 Chambers, N. Y., 5 Murray Iron Works, Burlington, Iowa. starrae Candles. Makeroof James Boyd's Sons, 10 and 12 Franktin, N. Y. ining Spikes Roachery Geo. D., Pottaville, Pa.	Smith, Sution & Co., Pittsburgh, Pa
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Valentine J., 15 Alling, Newark, N. J. oldere' Tools. Carrer H. 200 Fearl, N. Y. ouse Trans. Catchemative. Makers of. Dietz R. E., 54 and 56 Fulton, N. Y.	Wison, takeman, taylor & Co., 185 Grand, N. Y. 9
Carter H. 230 Pearl, N. Y. ouse Trans. Catchemnilve, Makers of, Dietz R. R., Mang 56 Fulton, N. Y.	Chatillon & Sons, 91 and 95 CHff, N. Y
	10 Steel Stanps. Rogers Richard H., 45 Ann, N. Y
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	I Highe Crusher Co New Haven (1)
Continental Nickel Platting Works, 47 Ann. N. Y. Hartman John, 275 N. Seventh, Philadelphis. Manhattan Nickel Works, 180 and 182 Coster, N. Y. New York Nickel Platting Co. 133 West 25th, N. Y. Owen S. S. & Co., 121 E. 18, N. Y. Williams, S. & Co., 121 E. 18, N. Y. Williams, Co., 121 E. 18, N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, E. D., N. Y. Williams, C. Co., 12 First at., Brooklyn, C. Co., 12 First at., Brook	Stoves. Maters of Josephan, N. Y. 28 Inlog tove Works, 70 Beekman, N. Y. 28 Stove Boards, Manufacturers of. Shepard Sidney & Co., Baffalo N. Y. 31
Rochrig, Fred Wm., 417 Center, N. Y. Wicks & Co., 73 First st., Brooklyn, E. D., N. Y.	Fallows Jas. & Co., rear 51 N. 3rd., Phila
Wilder & Co., 114 Fulton, N. Y. orway Shapes, Rollers of, Rowland Wm. & Harvey, Frankford, Phile	Twist Drills. Makers of. Morse Twist Drill & Mach. Co., N.Bedford Mass12 Tackle Blocks, Makers of.
Gallauget r. W Sand 5 Wall, N. Y.	40 Tackte Blacks, Makers of . Burr & Co., 31 Peek Slip N. Y Penfield Block Works, Lockport, N. Y 13 Tiebout W. & J., 230 Pearl, N. Y 16
Cark Bros. etc Makers of. Euiler, Lord & Co., 139 Green wich. N. Y. Haskell W. H. & Co., Psytucket. R. I. Haskell W. H. & Co. Psytucket. R. I. Roseberry Geo., D. Powiller. Roseber	Tacks. American Tack Co., !17 Chambers, N. Y
Haakell W. H. & Co., Pawtucket, R. I. Lewis, Oliver & Phillips, Pittsburgh, Pa. Roseberry Geo, D., Pottsville, Pa	Field A. & Sons. Taunton Mass. 19 Grundy & Kenworthy, 165 Greenwich, N.Y. 34 Loring Samuel, Plymouth, Mass. 84
Russell, Birdsall & Ward, Port Chester, N. Y. Sheiton Co., Birminguam, Conn	Shelton Co., Birmingham, Ct
tunon Nut Co., 78 Beekman N. Y	Grundy & Kenworthy, 165 Greenwich, N. Y. 34 Loring Samuel, Plymouth, Mass. 34 Shelton Co. Birmingham, Ct. 34 Taps and Dies. Taps and Dies. Transfer Grunments. 40 Transfer Grunments. 55 Fecticler Julius, 191 John, N. Y. 55 Bulley Leonard & Co., Hartford, Ct. 37 Disston Henry & Sons, Phils. 29 Tube Cleaners. 29 Tube Cleaners. 29 Tube Cleaners. 29 Tube Cleaners. 29
Riesener A., 160 William, N. Y. It Lubricating, Makers of Lester Oil Co., 183 Water, N. Y.	Bailey Leonard & Co., Hartford, Ct
Id Iron, etc. Gregg H L. & Co., 108 Walnut. Philadelphia	Tube Cleaners. The Chalmers Spence Co., foot of E. 9th, N. Y26 Tabe Expanders.
Gresz H. L. & Co., 108 Walnut. Philadelphia Fre Gresz H. L. & Co., 108 Walnut. Philadelphia Fre Gresz H. L. & Co., 108 Walnut. Philadelphia Black Grusher Co. Black Grusher Co. Black Grusher Co. Walnut Co. 117 Falton. N. Y. A. W. Briesen. 288 Broadway, N. Y. Cox & Cox. 229 Broadway, N. Y. Gilmore, Smith & Co., Wasdington, D. C. Munn & Co., 250 Prindway, N. Y. Gilmore, Smith & Co., Wasdington, D. C. Munn & Co., Scientific American 37 Park Row N. N. Spencer A. H., 28 State Boston, Misson, D. C. Munn & Co., Scientific American 37 Park Row N. N. Spencer A. H., 28 State Boston, Misson, D. C. Munn & Co., Scientific American 37 Park Row N. N. Spencer A. H., 28 State Boston, Misson, N. Paccoat & Malle 227 Pear, Phila. Paccoat & Maule 227 Pear, Phila. Pipe. Water and Gas., Makers of, Bart Edward, 78 John, N. Y. Leighton Bridge and Iro; Works, Rochestor, N. Y. McNeal John & Sons, Burlington, N. J. Warren Foundry & Macn. Co., Phillipsourg, N. J. Warren Foundry & Macn. Co. Buck Bros., Millbury, Mass. Middletown Tool Co., 18 & 20 Cliff, N. Y. Planess. Manufacturers of Baley Wringing Machine Co., 16 Chambers, N. Y. Baley Wringing Machine Co., 16 Chambers, N. Y.	
Devoe F. W. & Co., 117 Fulton, N. Y Intent Soficitors. A. V. Briesen, 228 Broadway, N. T.	Junios Judson & Son. Rochester. N. Y
Cox & Cox .229 Broadway, N. Y. Gilmore, Smith & Co Wasdington, D. C	28 Bailey Wringing Machine Co., 106 Chambers, N. Y., 25
Munn & Co., Scientific American 37 Park Row N. 1. Spencer A. H., 28 State Boston, Mass.	Millers Falls Co., 74 Chambers, N. Y 25
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Pancoast & Maule. 227 Pear. Phila Pipe. Water and Gas. Makers of.	26 Oakley & Keating, 40 Cortlandt, N. V. 32
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Warren Foundry & Mach. Co., Philipsburg, N. J Wood R. D. & Co., 400 Chesnut, Phila	Water Motor. Backus Bros., Newark, N. J. 12
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Planes. Manufacturers of Balley Wringing Machine Co., 16 Chambers, N. Y. Greenfield Tool Co., Greenfield, Mass Staniey Ruie & Level Co., 35 Chambers, N. Y.	Salve Governor Co., Bethlehem, Pa.
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Derby Silver Co., Derby, Ct., Kogers & Bros., 203 Broadway, N. Y. Plows, Chilled Iron. Makers of. South Bend Iron Works, South Bend. Ind.	.ii Semple, Birge & Co., St. Louis, Mo
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Plumberw' Materials, Manufacturers of Baltimore Beil and Brass Works, 58 and 25 Holli day, Baltimore, Md. Everhard Jas. M., Scranton, Pa. Beddiela, Bowen & Walworth Co., Unicago, Ill. Coar wm. S. & Co., 106 Centre, N. Y. Power Hammers. Material The Selles C. & Co. Matchester, N. B. Porsalth S. C. & Co. Matchester, N. B. Merriman A. V. M. Matthewson, Co. Middletown, Ct. Peck Milo, New Haven, Coun.	Wire, Manufacturers of,
Peck Milo. New Haven. Conn Pressare Blowers. Makers of.	Trenton Iron Co., Trenton. N. J. Wire Goods, Manufacturers of. A. A. Arnold, New Haven, Conn. Corning Jasper E., 36Cliff, N. Y. Fatey W. S., 56 Fulton, N. X. Gilbert & Biennett Mig. Co., 273 Fearl, N. Y. Wire Rope, Iron and Steel, Makers of. Hazard Mig. Co., Wikesbarre, Pa. 2 Roebling's John A. Sons. Trenton, N. J. Wrenches, Manufacturers of. Austin J. & Co., 168 Fulton, N. Y. Semis & Call Hdw. & Tool Co., Springfield, Mass. 35 Cocs A. G. & Co., Worcester, Mass. Coc L. & Co., Worch 5th, Phila. Flanglu W. J. & Co., 38 North 5th, Phila. Flanglu W. J. & Co., 38 North 5th, Phila.
Pessare Howers, Maker of, Keystone Fortshile Forgs Co. Philadelphia Wild Is, W., 20 Cortandt, N. Y. Printing Presses. Kelsey & Co., Meriden, Conn	23 Steey W. S. 55 Fulton, N. Y
Relacy & Co., Meriden, Conn	Howard & Morae, 45 Fulton, N. Y. Wire Rope, Fron and Steel. Makers of. Hazard Mfg. Co., Wilkesbarre, Pa.
Palleys, Friction. Msson Volney W. & Co., Providence, R. I Yocom & Son. Drinker, below 147 N. 2nd, Phin Pumps, Makers of.	39 Roebling's John A Sons. Trenton, N. J
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Rumsey & Co., Seneca Fails, N. Y. Union Mfg. Co., Se Chambers, N. Y.	Coer L. & Co., Worcester Mass
Pyrometers. Brown Edward, Sti Walnut, Phila. Ratiroad and Mining Tools. Metcalf, Paul & Co., Pittaburgh, Pa	Wringers, Balley Wringing Machine Co., 106 Chambers N T., 23 The American Machine C., 430 Walnut, Phila36
Rogers H. A. 19 John, N. Y. Rails, Iron or Steel, Makers of, Arking Bros. Pottaville, Pa	Establish
Jackson & Tyler Bastimore, Md. Rogers H. A. 19 John, N. Y. Rahls, Iron or Steel, Makers of. Atkins Bros., Pottaville, Ps. Cambris Iron Co., Johnstown, Ps. Cleveland Rolling Mill Co., Cleveland, O. Gritswold John A. & Co., Troy, N. Y. Lacks awarns Iron and Cosl Co., Sernation, Ps. Milwankee Iron Co., Milwankee, Wis. The Edgar Thomson Scott Co., 57 Hroadway, N. Y. B. F. Badger & Son Charlestown, Mass. Hefrigersiers.	C. S. OSBO
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Refrigerators. Law Wm. 709 and 711 Sd ave., N. Y	.26 96 Mechanic Street
Revolvers.	.87
Tryon Edward B., 9f. & Co., Fills. Kivets. Thorn George, 151 Center, N. Y. Tumme's Son Peter, 241 North 8th. Brooklyn, E. D., Rond scrapers. &c., Makers of, Revolving Scraper Co. Columbus O. Reilling Mill Hachbuery, etc., Manuacturers Moore-agnes, Co. 16th and Rationary of Policy.	JOHN CRANE, Agent, 1
Revolving Scraper Co., Columbus, O., Reiling Mili Machinery, etc., Manufacturers Moore cames, Cor 16th and Buttenwayed, Phili-	GREENSBORO' H
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American Saw Co., Trenton, N. J. Atkins E. C. & Co., Indianapolis, and	12
Staniev duie and Level Co., 35 Chambers 81. **Natdlery Ha. 4 sare, Makers of Osborne C. 5. & Co., 50 Mechanic, Newark, N. J. **Sand and Emery Paper, Makers of Sand and Emery Paper, Makers of Beader Acamson & Co., 130 Market, Phila. **Saws. Makers of Preston, N. J. **Amorican Saw Co., Indianabolis, Ind. **Duston Henry & Sons, Phila. **Peace & Hogan, Williameburg, N. Y. **Spear & Jackson, 39 Chambers, N. Y. **Wheeler, Madden & Clemson, Mig. Co., Middletow, N. Y.	12
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Mindleboro Shovel Co., & Oliver, Boston	
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Smerting Works, Williamsburgh, N. Y. 2 Binn's Smelting Works, Williamsburgh, N. Y. 2 Du-Pisme & Co., 138 & 390 Buttonwood, Phila. 49 Hooks Smelting Co., Phila., Pa. 2 Reeves Paul S., 780 South Broad St. Phila. 40 Stamped and Jansaned Tiv Ware.	-
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Stamped and Japanned Tip Ware. Shepard Sidney & Co., Buffalo, N. Y	
Steam Hummers, etc., Makers of. Bradley Mfg. Co., Syracuse, N. Y	10
Stafford Mfg. Co., 66 Fulton, N. V	4000
Snaps, Harness, Makers of, Hold Back and Snap Co., Troy, N. Y	6
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Crucible Steel Casting Co., Pittsburgh, Pa	7
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Hobson Francis & Son, 97 John, N. Y	
! iersone & Co., 24 Broadway, N. Y	
Van Wart & McCoy, 134 and 136 Duane, N. Y	-
W Hawkeworth, Ellison & Co., 72 John, N. Y. W Hawkeworth, Ellison & Co., 72 John, N. Y. Andersofi & Woods Pitzaburgs. Andersofi & Woods Pitzaburgs. Chrome Steel Co., Brookvin, E. D. 32 Cleveland Rolling Mill Co., Uleveland, O. 6 Sautter D. G. & Co., Jersey City, N. Y. 33 Grawold Jonn A. & Co., Troy, N. Y. 34 Lackswanna Fron and Coal Co., Seranton, Pr. 5 Marvale Steel Works, Nicetown, Phila., Ps. 38 Mines Mechal & Faustin, Prizabargh. 38 Smith, Sutton & Co., Pitzourgh, Ps. 38 Smith, Sutton & Co., Pitzourgh, Ps. 39 Smith, Sutton & Co., Pitzourgh, Ps. 39 Singer, Nimele & Co., Pitzourgh, Ps. 39 The Edgar Thomson Steel Co., 58 Broadway, N. Y. 39 Ties! Fens (*pencerian) 1 Vision, I lakeman, Taylor & Co., 138 Grand, N. Y. 39 Steel Manueller & Co., 168 & 164 W. 27th, N. Y. 30 Steel Manueller & Co., 168 & 164 W. 27th, N. Y. 30 Steel Spiral Springes. Manufacturers of Steel Stanges, 91 and 95 Cliff, N. Y. 30 Steel Manueller & Ann. N. Y. 30 Steel Manueller & Ann. N. Y. 31 Steel Manueller & Ann. N. Y. 32 Segreen Spiral Manufacturers of Steel Manueller & Ann. N. Y. 32 Segreen Spiral Springes.	1.
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Stocks and Dies. 28	1 1
Rogers Richard H., 45 Ann. N. I. Stocks and Dies. Holroyd & Co., Waterford, N. Y. Stop Grees, Water Gras & Co., Matersof Armstrong & Hutchinson, Alleghens, Pa. Stone Crushing Machines. Biake Crusher Co., New Haven, Ct	1
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PROVE INDICATE, MANUACTURETHOF.	
Sicouard Sidney &-Co., Buffalo N. Y. Tan Toys, Fallows Jas. & Co., rear 51 N. 3rd., Phila. 54 Fallows Jas. & Co., rear 51 N. 3rd., Phila. 54 Fallows Jas. & Co., rear 51 N. 3rd., Phila. 54 Fackle File. McKerr al. Bur & Co., 31 Peck Siln N. Fended Biock Works, Lockport, N. Y. 55 Filesut W. & J., 250 Pearl, N. Tamerican Tack Co., 17 Chambers, N. Y. 56 Tamerican Tack Co., 17 Chambers, N. Y. 56 The Common Tack Co., 17 Chambers, N. Y. 57 Tamerican Tack Co., 17 Chambers, N. Y. 58 The Common Tack Co., 17 Chambers, N. Y. 58 The Common Tack Co., 17 Chambers, N. Y. 58 The Common Tack Co., 17 Chambers, N. Y. 58 The Common Tack Co., 17 Chambers, N. Y. 58 The Common Tack Co., 17 Chambers, N. Y. 59 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 50 The Common Tack Co., 17 Chambers, N. Y. 51 The Common Tack Co., 17 Chambers, N. Y. 51 The Common Tack Co., 18 Co.,	
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Loring Samuel, Plymouth, Mass	
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Fechteler Julius, 194 John, N. Y	
Disston Henry & Sons, Phila	
The Chaimers Spence Co., Toot of E. #th, N. Y	
Junius Judson & Son, Rochester, N. Y	
Ludlow Vaive Mfg. Co., Trov. N. Y. Visers. Builey Wringing Machine Co., 196 Chambers, N. Y. 22 Mores Falls Co., 74 Chambers, N. Y. 22 Mores Falls Co., 74 Chambers, N. Y. 22 Howard fron Works. Buffalo, N. Y. 22 Howard fron Works. Buffalo, N. Y. 22 Fenfield Elmore, Middletown, Conn. 11 Treaton Vise & Tooi Works, 101 & 108 Duane, B. Y. Wilson Mfg. Co., 57 Chambers N. Y. 8 Wu-bers. Makers of Oakley & Keating, 40 Cortlandt, N. Y. 8	5
Fisher & Norris Trenton N J 2 Howard fron Works, Buffalo, N. Y 2	5
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Win-hers, Makers of Oakley & Keating, 40 Cortlandt, N. Y	2
Wilson Mig. Co. 5: Chambers N Y. Wu-bers, Maker of Ortlandt, N Y. Oakley & Keating, 40 Cortlandt, N Y. Wart-huna's Detectors. Imhanser & Co. 212 Broadway, N Y. Buerk J. E., 54 Washington, Boston, Mass. Shive Governor Co., Bethlehem, Pa. Water Motor. 38	6 8
Shive Governor Co., Bethlehem, Pa	2
Hyalt W. F., 54 Beekman, N. Y. Weather Vanes. Raldwir V W 2.3 Poort N. V.	8
Welding Compounds. Schlerlob H., 21 Exchange Place, Jersey City, N. J	8
Robt King, 246 Plymouth, Brooklyn, N. Y	3
White Lead Manufacturers of Brooklyn White Lead Co., 89 Maiden Lane, N. 1	6
Jewett John & Sons 182 Front, N. Y	16
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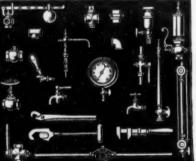
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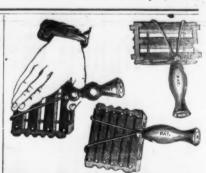


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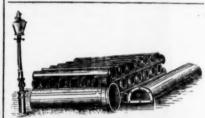
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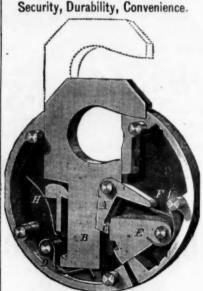


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35	Boston Rolling Mills, 17 Batterymarch, Boston. Burden from Works. Troy, N. Y. Rhode Island Horse Shoe Co., Providence, M. 1.,	
11	Ice Chisels.	
36	Holden E. J. & Co., 54 Beekman, N. Y. Lee Cream Freezers. Blatchley C. v., 566 Commerce, Phila. Insurance, Seiler. Hartford Steam Boller Inspection and Insurance Co., 36	
11	Hartford Steam Boiler Inspection and Insurance Co., M. Iron Brokers. Boynton Geo. A., 70 Wall, N. Y.	1
11	Hartford Steam Boller Inspection and Insurance Co 1 ron Brickers. Boynton Geo. A 70 Wall, N. Y. Bunting Howard, 18i Pearl, N. Y. Crane U. O., 10i John, N. Y. Hatra A. G., Pittsburgh, Pa Hazrd T. D. 30i Pearl, N. Y. Smitu W. Minor. 30 Beaver, N. Y. Iran Bridges. Leighton Bridge and Iron Works, Rochester, N. Y. 10	
Y 3	Smith W. Minor. 26 Beaver, N. Y. Iron Bildges. Leighton Bridge and Iron Works. Rochester, N. Y. 10	
Yii	Pron. Charconl, Warm or Cold Blast, Quincy John W., 98 William, N. Y.	1
11	Brown T. Horace, 2855, Wainut, Phila. Hand Jas. C. & Co., 614 ann 610 Market, Phila. Spooner & Collins, 8t. Lonis, Mo.	1
13	Spooler & Collins, St. Louis, M.O. [ron Raillas. Vreeland D., 188 W. 38, N. Y. [ron. Pig., Importers of. Williamson James & Co., 49 Wall. N. Y. [ron. Pig., Manufacturers of Parrott Peter P., Groenwood Fee., Orange co., N. Y.	
30	From Pin, Manufacturers of Parrott Peter P., Greenwood Fee., Orange co., N. Y. Iron Deniers.	1
81	Bonnell, Botsford & Co., Youngstown, O., Borden & Lovell, 70 and 71 West, N. Y. Clevaland, Brown & Co., Cleveland, O.	5
Y 7	Cooney Daniel F. 88 Wasoington, N. Y Huerstel G. 99 Market Silp, N. Y Fuller, Lord & Co., 139 Greenwich, N. Y	
10	Fuller, Dana & Fitz. 110 North. Boston. Harrison & Cilloon. 568 to 562 Water. N. Y. Jackson & Chase, 306 and 208 Franklin, N. Y. Jackson & Ag. and 454 Water. N. V.	
8	Oggen Wallace, 95, 67,59 and 91 Eim, N. Y Pierson & Co., 24 Broadway, N. Y Quincy John W., 26 William, N. Y	
16	Reed John H. & Co Mangin St., N. Y.	5
31	wathace will. B. & Co., Albany and Washington streets, N. Y. Warner A. B. & Sons, 28 and 29 West, N. Y. Williamson James & Co., 69 Wall, N. Y.	
26	Whitney A. R. & Bro. 59 Hudson N. Y Irou. Manufacturera of. Bradley. Reis & Co., 24 Cliff. N. Y.	4
86	Britannia Iron Works, Middleebro', Eng Burden Iron Works, Troy, N. Y. Cleveland Rolling Mill Co., Cleveland, O	5
3	Boston Rolling Mills, 17 Batterymarch, Boston	1
8	Leonard John, 450 & 451 West at. N. Y. Milwankee Iron Co., Milwankee, Wis. Noblit & Bro., Germantown Junction, Phila	100
9 ark,	Out Dominion Iron & Nail Works Co., Richmond, Va., Oxford Iron Co., 81 Washington, N. Y., Phillips, Nimick & Co., Pittsburgh, Pa.,	5
3	Snoenberger & Co., Fittaburgh, Pa	0
t3	Wood W. D. & Co., Pittaburgh, Pa	8
2	Fuller, Dana & Fitz, Boaton, Mass. Mitander Nils, 69 William, N. Y. Keys and Cotters. Munufactures of	40
	Barnes Geo. & Co., Syracuse, N. Y	6 /

Graham, Emlen & Passmore, Philadelphia	Sc
Lend Pipe. &c., Manufacturers of. Bavley, Farreli & Co., Pittsourgh, Pa	Se E
Sparks Thomas W., 121 Wainut, Phila	Sc.
Heuermain W. 4 Cedar, N. Y	Se
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D. K. Miller Lock Co., 12 Cherry, Philadelphia	SEL
D. K. Miler Lock Co., 12 Cherry, Philadelphia. Romer & Co., Newark, N. J. Rutton, Nut. Co., 78 Beekman, N. Y. Yale Lock Mtg. Co., 298 Broadway, N. Y.	1
Hale LOCK Mig. Co., 288 Postoway N. 169 Hachinery, Makers of Co. 1816 & Williams, 187 Pivmouth. Brooklyp. 28 Eureka Mig. Co., Boston. Mass. 27 Forsaith S. C. & Co., Manchester, N. H 66 Hendey Machine Co., Welcottsville, C 38 Fratt & Whitney Co., Hartford, Conn 38 Fratt & Whitney Co., Hartford, Conn 38 Fratt & Whitney Co., Hartford, Conn 38 The Hull & Belgen Co., Dasbury, Conn 38 Wetnerdl Hobert & Co., Chester, B 38 Wood Thomas 2108 Wood, Phila 39 Wood Thomas 2108 Wood, Phila 39	MI
Forsaith S. C. & Co., Manchester, N. H	1
Teal, C. A. & W. L., 4116 Lucilow, Phila., Pa. 25 The Hull & Belgen Co., Danbury, Conn. 23 Wetnertll Kohert & Co., Chester, Pa. 38	31
Wood Thomas 2106 Wood. Phila	Si
Machine Screwa, Makers of, Boone W. C., 28 Humboldt, Brooklyn, E. D	30 30
Machinistar Tools, Makerson, Machinistar, Machinistar Tools, Makerson, Machinistar, Makerson, Machinistar, Makerson, Machinistar, Machinis	8
Raiser Louis, 125 Worth, N. Y. 83 Yan Haagen C. & Co., Phila., Pa. 56 Machinists.	-
Hardman James Jr., 71 John, N. Y	2
Malleable Articles, Maker of. Hammer & Co., Branford, Ct	-
Bady Geo M.& Co., SS Classon Ave., Brooklyn, N. Y 7 Mallets. N. Y. Haudle & Mallet Works, 456 E. Houston35	20
Condition T. B. & Co., 25 and 27 Chiff. N. Y 2 Crane U. O., 104 John. N. Y	
Graves O. W., 42 Cliff, N. Y. Gregg H. L. Co., 105 Walnut, Phila. W. J. Hammong, Pittapurch, Pa.	S.
Pheips, Dodge & Co., Cliff, bet. John & Fulton, N. 7, 2 Purves A. & Son, cor. South and Penn, Phila	
Sturges Frank & Co., 72, 74 & 76 Lake (Thicago 8 Thomson A. A. & Co 213 water, N. Y	
Britton J. Blodgett 389 Walnut Phila 6 Wallace & Humbbrey, 18 Walnut, Phila 6 Metals, Anti-Friction	9
Thomson A. A. & Co., 213 water, N. Y. Metallurgists. Britton J. Bledgett 339 Walnut Phila. 6 Wallace & Humobrey, 118 Walnut, Phila. 6 Metals. Anti-Friction. Baidwin B. W. Pittsburgh, Pa 40 Blun's Smelting Works. Williamsburg, N. Y. 2 "Standard" Metal Co., 21 New Chambers, N. Y. 88 Metals Periorated. Hayes G., 71 8th ave 2 Metal Roofing. Hickox Mg. Co., 250 Pearl N. Y. 4 Went Chopping Machine Co., 16 Chambers, N. Y., 25 Murray Iron Works, Burlington, Iowa 34 Miners' Candles. Maker of James Boyd's Sons, 10 and 12 Franklin, N. Y., 12 Mining Spikes.	3
Hayes G., 718th ave. 2 Metal Roofing. Hickox Mig. Co., 200 Pearl N. V. 4	
Ment Chopping Machinery, Balley Wringing Machine Co. 16 Chambers, N. Y. 25 Murray Iron Works, Burlington, Iowa. 34	
Miners' Candles. Makera 07 James Boyd's Sons. 10 and 12 Franklin, N. Y	
Models.	1 2
Valentine 3, 10 Alling, Newark, N. J. 28. Molders' Tools, Carter H. 290 Pearl, N. Y. Mouse Trans. Curchemative, Makers of, Dietz R. E., 54 and 56 Fulton, N. Y. 40 Natia.	. in
begoenherger & Co. Pittshaugh Do.	180
Maltby, Curries & Co., 54 Reade, N. Y. Nickeel Platers. Colt A. T., 45 Beekman, N. Y. Continental Nickel Plating Works, 47 Ann. N. Y. Fartman John, 874 N. Seventh, Philadelphia. Manhactan Nickel Works, 189 and 182 Center, N. Y. Manhactan Nickel Works, 189 and 182 Center, N. Y. Mey York Nickel Plating Co., 183 West 28th, N. Y. Owen S. S. & Co., 121 E. 18, N. Y. Rochrig, Fred Wm., 417 Center, N. Y. Wilder & Co., 114 Futton, N. Y. Norway Shapes, Rollers of, Rowland Wm. & Harvey, Frankford, Phila. Note Brotker. Gallanget r. W. Sand S. Wall, N. Y.	2
Continental Nirkel Plating Works, 47 Ann. N. Y. 27 Hartman John, 375 N. Seventh, Philadelphia Manhattan Nickel Works, 180 and 182 Center, N. Y. 2	8
New York Nickel Plating Co. 133 West 25th, N Y . 27 Owen S. & Co., 121 E. 13, N. Y . 27 Rochrig, Fred Wm., 217 Center, N. Y . 27	7
Wicks & Co., 73 First st., Brooklyn, E. D., N. Y27 Wilder & Co., 114 Fulton, N. Y	7
Rowland Wm. & Harvey, Frankford, Phila	1
Cark Botts etc., Makers of. Cark Bros. & Co., Midale, Conn. 12 Euder, Lord & Co., 138 Green wich, N. Y	7
Lewis, Oliver & Phillips, Pittsburgh, Pa. 18 Roseberry Geo. D., Pottsville, Pa. 4 Russell, Birdsall & Ward Port Chester, N. 7	
Gailanget P. W 3 and 3 Wall, N. Y. *Nuts. Holts. etc., *Makers of.* Cark Bros. & Co. Middale. Com guiler, Lord & Co., 183 streen wich. N. Y. Haskell W. H. & Co., Pawtucket. R. I. Lewis, Oliver & Phillips. Pittsburgh. Pa. 18 Roseberry Geo. D., Pottsville. Pa. 4 Russell, Birdsall & Ward, Port Chester. N. Y. 9 Shelton Co., Birminghum, Conn	7
Riesener A., 160 William, N. Y	1
Old Iron, etc.	19
Gregg H L. & Co., 108 Walnut, Philadelphia	1
Patent Solicitors, A. V. Briesen, 258 Broadway, N. T	1
Gilmore, Smith & Co., Wasdington, D. C. 24 Howson & Son, Phila, and Washington, D. C. 28 Munn & Co., Scientific, American, 37 Park Row N. 39	
Beener A. H., 28 State Boston, Mass	
McNab & Harlin Mig. Co. 56 John. N. Y 26 Pancoast & Maule. 227 Pear. Phila 26 Pipe. Water and Gas. Makers of 26	1
Leighton Bridge and Iro: Works, Rochester, N. Y. 18 McNeal John & Sons, Burlington, N. J	
Wood R. D. & Co., 400 Chesnut, Phila.	
Middletown Tool Co., 18 & 27 Cliff, N. Y	
Middletown Tool Co., 18 & 27 Cliff. N. Y. Planes. Manufacturer of Balley Wringing Machine Co., 166 Chambers, N. Y. 25 Greenfield Tool Co., Greenfield, Mass	
Derby Silver Co. Derby. ct	
Plumbago. Pennsylvania Graphite Mining and Mfg. Co., Read-	
Pennsylvania Graphite Mining and Mfg. Co., Reading, Ps. M. Materials, Mainfacturers of Baltimore Bell and Brass Worss, 58 and 55 Holliday, Baltimore, Md. 12 Everhart Jas. M., Scranton, Pa. 46 Redfield, Bowen & walworth Co., Chicago, III. 46	
Baltimore Beli and Brass Worse, 58 and 58 Holli- day, Baltimore, Md	
Power Hammers, Makera of Forsath S. C. & Co., Manchester, N. H	
Merriman A. H., West Meriden, Ct	3
Keystone Portable Forga Co., Philadelphia	3
Kelsey & Co., Meriden, Conn)
Yocom & Son. Drinker, below 147 N. 2nd, Phitu 3 Pumps. Makers of, Bush R., 194 19th. Brooklyn, N. Y 28	
Clayton Jas. 11 Water. Brooklyn, N. Y. Douglas W. & B., Middletown Conn. Dungley & Co., Senece Valla N. V.	9
Union Mfg. Co., 38 Chambers, N. Y. Pyrometers. Brown Edward, 311 Walnut, Phila.	1
Meterali, Paul & Co., Pittsburgh, Pa	
Rogers H. A., 19 John, N. Y. Hails, Iron or Steel, Makers of, Asking Bross, Pottsville, Pa	
Cambria Iron Co., Johnstown, Pa Cleveland Rolling Mill Co., Cleveland, O. Griswold John A. & Co., Troy, N. Y.	000
Lackawarna Iron and Coal Co., Scranton, Pa Milwaukee Iron Co., Milwaukee, Wis. The Edgar Thomson Steel Co., 57 Broadway, N. Y., 38	-
Union Mr. Co., 98 Chambers, N. Y. Brown Edward, 31 Walout, Phila. Brown Edward, 31 Walout, Phila. Railroad and Mining Tools. Metcail, Paul & Co., Pittsburgh, Pa	5
Revolvers, Tayon Kilmand K. In a Co. Phile	1
Rivets. Rivets. Rivets. Thorn George. 151 Center, N. Y. Tumme's Son Peter, Sl. North Stn. Brooklyn, E. D. Read Scrapers. &c., Makers of, Revolving Scraper Co., Columbus. O. Relling Mill Machinery, etc., Manufacturers of Moore, ames. Cor. 16th and Battonwood, Phila.	4
Revolving Scraper Co., Columbus, O.,	ا
Roofing Paints. Prince's Metallic Paint Co., 235 Pearl, N. Y	5
Sitaniev dule and Level Co., 35 Chambers St	7
Sand and Emery Paper. Makers of Header Adamson & Co., 730 Market, Phila	1
Atkins F C & Co Indiananolis Ind	2000
Disston Henry & Sons, Phila	3
Saw Frames. Wood. Makers of.	0
Scales. Manufacturers of. Chattillon John & Sous. 91 Cliff. N. Y. Rienle Bros. Wh near Coates, Phila	8

Bruce Geo. W., 1 Platt, N. Y	2
Disaton Henry & Sons, Phila.	9
Sertine Sanths. Vermont Snath Co., 100 Cnambers, N. Y. Senmiles Tubes. Makers of Merchant & Co., Phila, Pa.	5
Merchant & Co., Phila., Pa	2
Hussey, Rinns & Co., Pittsburgh, Pa	8
Marx Bros., 48) B'way, N. Y	1
Smetting Works. Binn's Smelting Works, Williamsburgh, N. Y. Binn's Smelting Co., 1835 & 1995 Buttonwood, Phila. Rocks Smelting Co., Phila., 7a. Recees Paul S., 690 South Broad & Phila.	2
Hooks Smelting Co., Phila., Pa Reeves Paul S., 760 South Broad St. Phila	0
Stamped and Japanned Tip Ware. Shepard Sidney & Co., Buffalo, N. Y Sturges Frank & Co., 72, 74 & 76 Lake. Chicago	1
Steam Hammers, etc., Makers of. Bradley Mfg. Co., Syracuse, N. Y. Duageon Richara, 24 Columbia, N. Y.	8
Duageon Richard, 24 Commbia, N. Y	9
Stafford Mfg. Co., 66 Fulton, N. Y	2
Snaps. Harness. Makers of. Hold Back and Snap Co., Troy. N. Y	1
Howland Win. & Harvey, Frankford, Phila	0
Steam Pumps, etc. Manufacturers of Aquometer Seam Pump Co., 10 South, Del. Ave.,	
Midaletown Tool Co., 18 & 20 Cliff, N. Y. Springs. Rowland Wm. & Harvey, Frankford, Phila. Sanares, Steel and Iron, Makers of, Hart, Bliven & Mead Mrg. Co., 248 Pearl, N. Y. Steam Pamps, etc., Manufacturers of Aquometer Sceam Pump Co., 10 South, Del. Ave., Phil. Crane Bros. Mrg. Co. Chicago, Ill. Knowles Steam Pump Works, Warren, Mans. Valley Machine Co., East Hampton, Mass. Steam Trans Albany Steam Trap Co., Albany, N. Y. Steel Castings., Manufacturers, of	8
Valley Machine Co., East Hampton, Mass	5
Steam Trans Albany Steam Trap Co., Albany, N. Y. Steel Castings. Manufacturers of Flags Stanley G. & Co., 216 & 218 N. 3rd, Phila. Chester Castings Co., Evelina. Phila. Pa. Crucible Steel Casting Co., Pitsburgh, Pa. Pitsburgh Steel Casting Co., Pitsburgh, Pa.	0
Chester Castings Co., Evelina, Phila, Pa	0
Pittsburgh Steel Casting Co., Pittsburgh, Pa., Asteel importers, Carr J. & Rilley, & John, N. Y. Richard, Hyman, Wolff & Co., 16 Cliff, N. Y. Hobson Francis & Son, 97 John, N. Y. Micholson John & Sons, 88 Chambers, N. Y. Itersons & Co., 24 Broadway, N. Y. Sanderson Bros. & Co., 16 Cliff, N. Y. Sanderson Geo. & Co., 67 John, N. Y. Van Wart & McCoy, 134 and 136 Duane, N. Y. Wardlows, & C., 95 John, N. Y. Wardlows, & C., 95 John, N. Y. Welley Hawksworth, Ellieou & Co., 72 John, N. Y. Welley Hamfacturers.	2
Salzbacher, Hyman, Wolff & Co., 16 Cliff, N. Y Hobson Francis & Son, 97 John, N. Y Moss F. W., 80 John, N. Y.	12
Nicholson John & Sons, 88 Chambers, N. Y.	4
Sanderson Geo. & Co., 57 John, N. Y. Van Wart & McCoy, 134 and 136 Duane, N. Y.	12
Wardlow S. & C., 95 John, N. Y. W Hawksworth, Ellison & Co., 72 John, N. V.	32
W Hawkaworth, Ellison & Co., 72 John, N. Y. Steel Manufacturers, Anderson & Woods Pittsburgn. Chrome Steel Co., Brookiva, E. D., Cleveiand Rolling Mill Co., Cleveland, O., Gautier D. G. & Co., Jersey City, N. S., Grawold Jonn A. & Co., Troy, N. Y. Lackawanas Fron and Coal Go., Seranton, Fr. Manuals Steel Works, Nicetwan, Phila. Fs. Miller, Michael & Barwer, Francisco Phila. Smith, Sutton & Co., Pittsburgn, Pa. Smith, Sutton & Co., Pittsburgn, Pa. Singer, Nimick & Co., Pittsburgh. The Edgar Thomson Steel Co., 55 Broadway, N. Y. Fieel Fens ("pencerina) Ivison, Flakeman, Taylor & Co., 188 Grand, N. Y. Steel Fense "pencerina)	33
Gautier D. G. & Co., Jersey City, N. J. Griswold Jonn A. & Co., Troy, N. Y.	33
Lackawanna Iron and Coal Co., Scrantou, Ps., Augvale Steel Works, Micetown, Phila., Pa.	5 38 32
Rowland Wm. & Harvey, Frankford Phila Smith, Sutton & Co., Pittspurgn, Pa	40
Singer Nimick & Co., Pittsburgh. The Edgar Thomson Steel Co., 57 Broadway, N. Y	33
Tvinon, i lakeman, Taylor & Co., 188 Grand, N. Y. Tvinon, i lakeman, Taylor & Co., 188 Grand, N. Y. Chrk & Co. v., 182 & 184 W. 27th, N. Y. Street North North Springer, Manufacturers of Chatillon & Sons, 91 and 96 Cliff, N. Y.	9
Chatillon & Sons, 91 and 98 Cliff, N. Y.	9
	24
Holroyd & Co., Waterford, N. Y	36
Armstrong & Hutchinson, Allegneny, Fa	88
Rogers Richard H. 45 Ann, N. Y. Stocks and Dies. Holroyd & Co., Waterford, N. Y. Stop Gintes. Water Gins & Co., Makersof Armstrong & Hutchinson, Allegheny, Pa. Stone Crushing Machines. Blake Crusher Co., New Haven, Ct. Stoves. Makers of Union Stove Works, 70 Beekman, N. Y. Stove Bonrds, Manufacturers of. Shenard Sidney & Co., Buffalo N. Y. Tin Toy.	28
	81
Fallows Jas. & Co., rear 51 N. 8rd., Phils	12
Trickle Blocks, Makers w. Burr & Co., 31 Peck Silp N. Y Penfield Block Works, Lockport, N. Y Tiebout W. & J., 290 Pearl, N. Y	35
Tiebout W. & J., 290 Pearl, N. Y.	16
Grandy & Kenworthy 185 Greenwich N. V.	10
Loring Samuel, Plymouth, Mass. Shelton Co., Birmingham, Ct.	84 84
Capenter J. M., Pawtucket, R. I	40
Shelton Co., Birmingham, Ct. Tans and Dies. Capenter J. M., Pawtucket, R. L. Transter Grunments Fechteler Julius, 194 John, N. Y. Try Squares, Revels &c., Makers of Balley Leonard & Co., Harfford, Ct. Disston Henry & Sons, Phila. Tabe Cleaners.	26 27
	29
Tube Expanders. Dudgeon Richard. 24 Columbia, N. Y	29 26 .89
Tube Expanders, Dudgeon Richard. 24 Columbia, N. Y. Valves, Gas. Water and Steam, Junius Judson & Son. Rochester, N. Y. Stevens & McLean, 298 and 900 Monros N. Y.	29 26 .89 .38
Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester, N. Y. stevens & McLean, 298 and 300 Monroe, N. Y. Ludlow Valve Mg. Co. Trov. N. Y.	38 38 38
Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester, N. Y. stevens & McLean, 298 and 300 Monroe, N. Y. Ludlow Valve Mg. Co. Trov. N. Y.	38 38 38
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Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester, N. Y. stevens & McLean, 298 and 300 Monroe, N. Y. Ludlow Valve Mg. Co. Trov. N. Y.	38 38 38
Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester, N. Y. stevens & McLean, 298 and 300 Monroe, N. Y. Ludlow Valve Mg. Co. Trov. N. Y.	38 38 38
Tube Expinaces. Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester. N. Y. Loudow Valve Mig. Co., Trov. N. Y. Loudow Valve Mig. Co., Trov. N. Y. Bailey Wrinzing Machine Co., 166 Chambers. N. Y. Millers Falls Co., 74 Chambers. N. Y. Finner & Nortis Trenton. N. J. How'rd from Works. Buffalo. N. Y. Penneld Elmore, Middletown, Conn. Trenton Vise & Too. Works, 101 & 108 Duane, N. Y. Wilson Mig. Co., 37 Chambers. N. Y. Wu-bers, Makers Gortlandt, N. Y. Wat-hims. Makers Gortlandt, N. Y. Wat-hims. Steventry, 101 Berectors. Imhamser & Co., 21 Broadway. N. Y. Burek J. E., 54 Washington, Boston, Mass.	38 38 38 38 25 25 25 25 25 31 81 82
Tube Expinaces. Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Bailey Wrinzing Machine Co., 166 Chambers. N. Y. Millers Falls Co., 74 Chambers. N. Y. Finner & Nortis Trenton. N. J. How'rd from Works. Buffalo. N. Y. Penneld Elmore, Middletown, Conn. Trenton Vise & Too. Works, 101 & 108 Duane, N. Y. Wilson Mig. Co., 37 Chambers. N. Y. Wu-bers, Makers Gortlandt, N. Y. Wat-hims. Makers Gortlandt, N. Y. Wat-hims. Selectors. Imhanser & Co., 21 Stroadway. N. Y. Buck J. E., 54 Washington, Boston, Mass.	38 38 38 38 25 25 25 25 25 31 81 82
Tube Expinaces. Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Bailey Wrinzing Machine Co., 166 Chambers. N. Y. Millers Falls Co., 74 Chambers. N. Y. Finner & Nortis Trenton. N. J. How'rd from Works. Buffalo. N. Y. Penneld Elmore, Middletown, Conn. Trenton Vise & Too. Works, 101 & 108 Duane, N. Y. Wilson Mig. Co., 37 Chambers. N. Y. Wu-bers, Makers Gortlandt, N. Y. Wat-hims. Makers Gortlandt, N. Y. Wat-hims. Selectors. Imhanser & Co., 21 Stroadway. N. Y. Buck J. E., 54 Washington, Boston, Mass.	38 38 38 38 25 25 25 25 25 31 81 82
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Tube Expinaces. Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Bailey Wrinzing Machine Co., 166 Chambers. N. Y. Millers Falls Co., 74 Chambers. N. Y. Finner & Nortis Trenton. N. J. How'rd from Works. Buffalo. N. Y. Penneld Elmore, Middletown, Conn. Trenton Vise & Too. Works, 101 & 108 Duane, N. Y. Wilson Mig. Co., 37 Chambers. N. Y. Wu-bers, Makers Gortlandt, N. Y. Wat-hims. Makers Gortlandt, N. Y. Wat-hims. Selectors. Imhanser & Co., 21 Stroadway. N. Y. Buck J. E., 54 Washington, Boston, Mass.	38 38 38 38 25 25 25 25 25 31 81 82
Tube Expinaces. Dudgeon Richard. 24 Columbia. N. Y. Valves, Gas. Water and Steam. Junius Judson & Son. Rochester. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Ludlow Valve Mig. Co., Tov. N. Y. Bailey Wrinzing Machine Co., 166 Chambers. N. Y. Millers Falls Co., 74 Chambers. N. Y. Finner & Nortis Trenton. N. J. How'rd from Works. Buffalo. N. Y. Penneld Elmore, Middletown, Conn. Trenton Vise & Too. Works, 101 & 108 Duane, N. Y. Wilson Mig. Co., 37 Chambers. N. Y. Wu-bers, Makers Gortlandt, N. Y. Wat-hims. Makers Gortlandt, N. Y. Wat-hims. Selectors. Imhanser & Co., 21 Stroadway. N. Y. Buck J. E., 54 Washington, Boston, Mass.	38 38 38 38 25 25 25 25 25 31 81 82
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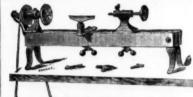


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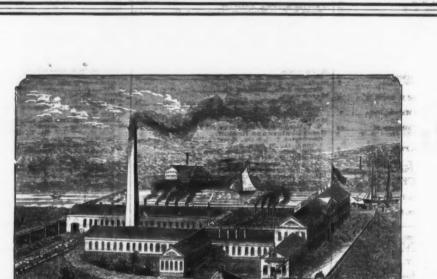
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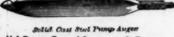
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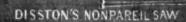
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10 10 10 75 10 2)	Rams dis 2 Garden Engines dis 20 Panches. Belt or Drive. per doz \$2.00; \$2.25; \$2.50 dis 25 Spring per doz \$6.90 - dis 20.50 dis 25
10 10 1 28	Barn Door, & Sand & Inch.
25 25 28 28 20	\$8 90 9 00 10 00 11 00
20,	Malleable
25 SE SE SE	Hunt's Glady
14	Sannder's dis 10±10 Kivet het (a) 10 Kivet het (a) 10 Iron and Tinned dis 55 (a 65 Iron and Tinned dis 55 (a 65 Iron and Tinned dis 40 (a 70 Copper Rivets and Burrs dis 40 (a 70 Nos nos dis 40 Per lb. 49c 50c 50c 50c 50c 50c 50c 50c 60c 70c Rivet Sets dis 10 Rand and Levee Scrapers dis 10
623 873 623 873 873	Rodedis 25
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nei 3 · i	Novelty. Manufacturers' List of May 19, 1976 Manila. Manufacturers' List of May 19, 1976 Manila. Manila. Manufacturers' List of May 19, 1976
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10 s nei 10 s 55 s	With Thrait & Son. dis 60&10 \$ dis 50&10 \$
ash	Self-Heating
10 %	2,2% & 3, 4 75 ds. Assorted, 4 25 s. Star. Fream \$3.25 ls. New England, same list as B. & A. Flint. dis 15 45 s. H. B. & M. Roman Flint dis 15 45 s. Sash Cord.
net 10 %	H. B. & M. Roman Filiat dis 1545 Sash Cord. Common # 5 16 @ 18c. net Patent # 5 24c. net
10 % 10 % 10 % 10 %	Common. \$\psi\$ 16 \text{ \text{\text{\$\alpha\$}} 15 \text{ \text{\$\alpha\$}}
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10 % 15 % 10 %	New England
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Sausage Staffers or Fillers. \$\psi\$ doz \$20_\text{dis }30\$
5 %	" Hand, Panel, Rip, &cdis 15 %
0 % % % % % % % % % % % % % % % % % % %	H. W. Peace's Circulars dis 25 Mill, Gang and Mulay dis 25 Mill, Gang and Mulay dis 25 Crose Cut, Wood, Hand, &c. dis 25 E. M. Boyaton's Lightning, Crose Cuts dis 20 Crose Cuts dis 25 Crose Cuts
76. 5 %	Wheeler & Clemson Mfg. Co.'s Handdis 15 \$
14D	Livingston's Framed Wood— Nos. 10: 104 108 104 106 108 Per dox \$1:70 104 108 104 106 108 Per dox \$1:70 1040 12:00 900 8:00 8:00 dis 10 5
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18	Scales
×	Imitation
* *	Universal Family dis 20% Scale Beams. No. 1 800 to 1900 lbs
*	Universal Family Scale Beam dis 25 Scale Beam dis 25 No. 1 80 to 1300 ibs
00 W W W	Foot. dis 60 & 105 Ship (common). per doz 38 00 net Ship.—Providence Tool Co. dis 105 Screw Drivers.
X X X St	Ship - Providence Tool Co. dis 19
et rt	Flat Head Iron, list Sept. 1. 1875, R.&E. Mrg. Co.dis 624
MANA	Round Head Iron did 45 Flat Head Brass at 18 18 18 18 18 18 18 18 18 18 18 18 18
* * *	Machine-Flat Head, Iron, List Jan. 12, 1875dis 25
8	Brass, "
	-Wood, Beach # doz \$3.00 net
- 1	" Hunason Beckiev & Co.'s. dis 40&5 5 Box Hees dis 15 5
N AMM I	Sey these Blood's German Steel, Grass \$\psi\$ doz \$10 00
nd s	Biood's Excelaior and Granger. "Young America. 10 50 trom list. "Sliver Clipper. 13 (9) trom list. Wadaworth's Grass. 14 30 4
XI.	Bush dis 20 5

Shears and Scissors dis 784:10 dis 784:10 dis 784:10 dis 41:5	METALS.	4 Per
September Coar Steel Coar	IRONDUTY Bars, I to 1% cents per lb., Sheet, Band.	
Barnard's Lamp Trimmersper doz \$8'78	(RON.—Dury Bars, i to 1% cents per lb., Sheet, Band, Hoop and Scroll, 1% to 1% cents per lb. Provided, that none of the above iron shall buy a less rate of duty han 35 per cent. Pig. 37 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, 48 per ton; Cast Scrap, 45 per ton. Rairoad, 70 cents per 100 lbs. Boiler and Plate, 1% cents per lb.	12 16 16 Per
Sliding Door, M. W. & Co. list	cents per lb.; Wrought Scrap, \$8 per ton: Cast Scrap, \$ per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate 114 cents per 100 lbs.	18 20
Shie aves. Shie aves. Shie aves. Shiding Dor. M. W. & Co. list. dis 268-582	Pig 1's cents per 10. Pig 1's American Pig 1'	Comp
		Door
Shove is and Spages	Cottness	High Low Gildin
Old Colonynew list dis 10&5 \$\) Middleboro Shovel Conew list dis 20 \$\) C & Lappings & Co	Eginton. 27 50	Gildir Turni Ord
Dunning s Shovels and Scoopsdis 2027/ 5	Bar 170n. Am. Refined, at mill	date, Tem be add
Shove s and Tongs. Iron and Brass Head, t. & E. list.	American. at works, currency ₱ ton 39 (0 ≤ 42 00 01d Hajis	ANT
States. Square Frames, Round Cornered, by casedis 65&10¶ Less than a case	Wrought Scrap, from yard " 28 00	LEA per Spani
Less than a case	W to 4 in sound and somero	Germ
Spoke Shaves. Denance Metallic		Amer Bar Pipe. Tin L
Spoke Shaves	\$ to \$1m round and square \$ \$ \$ \$ 25e \$ 1 to \$6 in \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ 1 in \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Sheet Shot
Spoke Trimmers. Bonney.sper doz \$10.00 dis 40 %	Bands- to 6 x 12 to 8-16	N. P.
Npoke Triumers Per doz \$10.00 dis 40 Stearn Stearn Stearn No. 1, \$15.00 No. 2, \$12.00 doz, dis 334.6210 Douglass Douglass Douglass Douglass Douglass No. 1, \$15.00 No. 2, \$12.00 doz, dis 334.6210 Douglass No. 1, \$15.00 No. 2, \$12.00 doz 30.610 doz 30	Plow size	SOL
Spoons Class Cla	American and Knglish, American. English, American. American and Knglish, American. English, American. Engl	at 7
Basting dis 10 % Britannia	Nos. 10 to 20	way
Rogers & Bro. A 1	27	mer neri
Derby Silver Co. dis 40 & 5 x	25 to 25 ' 9 %c ' 8 c	Tool.
German Silver	77 10/50 93/50 93/50 10/	Spring Homo
Tables. 2-75 at aet Tin (Cowles Hdw. Co.) dis 10 g	Russia, Nos. 8 to 16. " 14 4c " 1846c " Stained, No. 1 " 1846c telgran 10c	Tire Machi File
		File Sheet. Saw P
Hindostan Stone	\$6 5 5% 6 7 inch. \$2.50 5.50 4.50 5.25 6.50 per doz.	
Sand Stone	BUSSIA IRON. 434 5 534 6 7 Inch. 55'03 700 950 12'00 14'00 per dog.	Tool Tool, Spring
No. 2, 9 to 25c net No. 1, 9 to 60c net Arkansas Stone	(:OPPER -Dott Pig, Barand ingot, Sc.; old copper.	Machi Hamn Gun o
Stone	(*OPPER -Doit Pig, Barand ingot, Sc.; old copper, 4 cents 6 &; Makufactured (!ncluding all articles of which copper is a component of chief value) 45 % ad valorem.	Engli
Stove Pollah.	American Ingot 22 @ 22%c	66 64 66
Gold Medal. From \$6 00 dis 25 s Rising Sun. per gross \$5.75 net	deariers Conner, ordinary fizes, over 16 oz., per	66
Steel	Braziers Copper. ordinary sizes, 16 oz. and over 12 oz., per square foot	Germa
Nickei Flaved	Circles less than 14 inch in diameter	Sheet
Squares. Steel. dis 50 %; full cases, dis 50&10 %; full cases, dis 50 %; full ca	segment and Fateri Success	File S
Winterbottom's Try and Mitredis 20&10 % Tacks. Brads. &c.—List of January 1, 1876.	Bolt Copper	66
Tacks, Brads, &c. — List of January 1, 1876. Tacks, Half Weight, American dis 75& Full 1885 .	No Copper is Sheathing except 14x43 inches, and not to exceed \$4 oz. to the square foot. Sheathing Copper, tinned on one side, by the	SPEI per 1
Full dis 10 % Carpet, Am. and Swedes dis 10 % for cash Leather Head dis 10%	case	Silesia
Haif Swedes d. 858 Full dis 936 Carpet, Am. and Swedes dis 106 Carpet, Am. and Swedes dis 106 Leather Head dis 106 Copper \$2.5 dis 508 Breds, Half Weight dis 508 Shoe Nails—	For timing both sides, double the above amount. O'NEILL'S PATENT PLANISHED COPPER.	TIN- per l Man
Shoe Nails—	The state of the s	Bars.
Double Pointed Tacks	14 and 16 oz. and heavier	Banca Straits Englis
Tap Borers. dis 20&10 € Commor and Ring. dis 20&10 € Yees' Tap Borers. dis 10&10 € 25 € Enterprise Mfg. Co. dis 20 € 30 €		
Enterprise Mig. Co. dis 20 % Tapes, Measuring.	14 and 16 oz. and heavier	1 C 10x 12x 14x
Tapes, Measuring. American Flank and Cap Co. dis 30 g Eddy'a. dis 20 g	Brass. Brown & Sharp's Gauge the Standard except for Fine	1 X 10x 12x 14x
Tea Trays. American Tea Tray Co. dis 15 x Thermometers. Tin Case. dis 50&10 x Toe Calks.	BRASS MANUFACTURERS' PRIOR LIST.	D C 12: D X 12 For e
Tin Case	October 27th, 1875. Net cash prices for Roll and Sheet Brass, Wree, &c., for quantities of 130 pounds and over st one time. For less than 100 pounds, three cents additional.	
Tobacco Cutters, Enterprise Mfg. Co. (Champion)	less than 100 pounds, three cents additional. HIGH BRASS All Nos. to No. 28, and widths 14 in. and under2°c	I C 10x I C 12x
All Iron per doz \$10 50 dis 30 20 5 Nashua Lock Co. s per doz \$18 00 dis 50 5	All Nos. to No. 28, and widths 14 in. and under	I C 14x
P.S. & W. dis 10 % Traps.	1/2C. W m advance on each No. above Nos. 28 to 38, in- clusive. All Brass thinner than No. 38 is Platers' Brass. at45c Sheets 3/458 in. and all abects cut to particular sizes and lengths.	I C 14x
Peck, Stow & Wilcox	Sheets 24x48 in. and all aheets cut to particular sizes and lengths.	1 C 20x2
Mouse, Wood Choker	Sheets 34x84 in, and all aneets out to particular sizes and lengths. SSc Printers' Rules. SSc Sheets wider than 30 in and under 40 in. 40c Sheets wider than 30 in, and over. 45c Curcu as sheets, in diam. From 4 in. to 14 inclusive. 35c	C 20x2
Round, Wire # dox \$1 50 to 2 00 net	Cure in we sets, in diam. From 4 in. to 14 inclusive 40c .	ZINC.
Cage. # doz 2 50. dis 10 5 Patent Self Settingper doz holes 2c net Catch-em-ahve. # doz 81 25 net	" 40 In	Baeet .
Catche-en-surve	Four cents * b more than High Brass. Gilding Metal, 7c, * b more than High Brass.	Do.
Peace's Piastering. dis 20 q Rose's Brick. dis 5 g Brades' Brick gold dis 10 g	Planed or Polished48c	Pap
Worrall's Brick and Plastering dis 20 % Garden dis 25 %	Metal, in width 2 in. to 1/4 in. to No. 30, inclusive, 1c. per	Canvas
Triers. Butter and Cheese	b. advance. Metal, in width 2 in. to 1 in., thinner than No. 30, 2c. per b. advance.	White i
Visco. Solid Box, Trenton49 to 160 lbs., 16c.: 160 and over, 20c	Metal, in width 1 in. to 1/4 thinner than No. 30, Sc. per w. advance. Metal, in width 1/4 in. to 1/4, to No. 30, 2c. per w. ad-	Colored
" Wilson's	wance. Metal, in width 1/4 in. to 1/4 thinner than No. 30, 5c. per m. advance.	Soft wo
Paraliel, Parker's	Metal, ¼ in. in width and less, 10c. per lb. advance GERMAN SILVER MARKET METAL AND WIRE	Jute Bu Kentuc Waste
Trenton dis 15 % Backus and Union dis 25 %	Market Metal. Wire.	Kentuci Sentuci Sakum
Figher & Norris. dis 15% 10 % Buffaio. dis 25 %	** per canto, 12 II., 10 No. 20	Grass re
Simpson's Adjustable	German Silver Sheets over 12 in. wide, and weighing more than 16 ms., \$2 per m., net. Advance 2c. for each additional in., in width above 12	White C
Value State Stat	Advance 2c. for each additional in., in width above 12 in., and 2c. per b. on each No. thinner than Nos. 26 to 36	Hard W
Coal Carden and Stone (Proplet & Charmen)	All German Silver thinner than No. St. in Platers' at	Soft White S Mixed S mperfe
AA CIT AA HECTIS	Cit. for the 14 Abres and Comment	Book St
Brass and CopperList of Oct. 27, 1875, net Bright and AnnealedNos. 0 @ 18 dis 45 @ 50	BRASS AND COPPER WIRE. Gild g and f High Brass. Low Brass. Cop'r. Nos. 0 to 20	ewspa Prints Pure Ma Bogus M
Revised list. dis 604:19 \$ Wire. Brase and Copper. List of Oct. 27, 1855, net Bright and Annealed. Nos. 0 @ 18 dis 45 @ 50 \$ 18 @ 38 dis 50 @ 55 \$ Coppered. 27 @ 38 dis 50 @ 65 \$ Coppered. 0	High Brass, Low Brass, Cop'r, I Nos. 0 to 20	dndere
Galvanized, Nos. 9 to 9	Brass Rods, No. 8 and larger. 0.36 0.40 0.46 7	Traw B.
Cast Steel	smaller than No. 3040 0.44 0.50 Fancy Wire not less than 4 cents per pound advance	atinet '
balvanized Telegraph. Nos. 10 and 11	Spring Wire, 2 cts. per lb. advance. FINE WIRE, BY THE OLD ENGLISH FINE WIRE GAUGE.	opper.
" Grape, " 10 to 14	Gild'g and E	leavy Cold lead lea lead
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Wresches. American Adjustable	No. 30. U-48 U-52 U-58 U-58 U-50 U-54 U-62 S No. 31. U-53 U-56 U-68 U-68 U-68 U-68 U-68 U-68 U-68 U-6	neltar . Vrough
Diagonal	No. 32	lachine ight Ir tove pl
Pattern (Wrought) dis 50&10 \$ (Malleable) dis 65&10 \$ (Samond Hardware Co.	No. 85	lurnt lr
Indsay's Patent dis 25 Faft's Pattern dis 20 Captern Days	No. 38	
Bemis & Call's Patent Combination new list dis 25 g Bemis & Call's Patent Combination dis 20 & 5 g Merrick's Pattern dis 25 & 25 g	Plain to No. 30 inclusive, above ½ in. to 3 in	
Aiken's Pocket (Bright)per dox \$10.00—dis 50&10 c Wringers. Less than 2 doz 2 doz lets	Nos. 24, 25, 26, four cents advance on List for each	inck in
rovidence, with Cog Wheeis\$2200 \$4000 Gusehold, without 6000 5840 Universal.	Number. Above No. 26, special rates.	lack Pr
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with 77:00 70:00 therman, 77:00 70:00	All Mandret Drawn Tuses, 5 cents advance on List	rown, E
Beliance, with " 6000 58:00 67:00 52:00 67	English, Scotch and Extra Patterns Fancy Tubing to No. 20, 9 cents above Plain. Grubing Bawed or Cut 2 to 4 feet long, 2 cents ad.	reen. C
Indda Picture Wire	Frices. Fancy Tubing, 4 cents advance on List above Plain. English, Scotch and Extra Patterns Fancy Tubing to No. 30, 9 cents above Plain. Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List. Add to 2 cents 36 cent for each additional cutting under two feet. All Mandrel Drawn Tubes under % in., 25 cents per nound advance.	ineral I
Stamped fin Ware.	All Mandrel Drawn Tubes under % in., 25 cents per pound advance. ZINO TUBING.	range k
Stramped Tin Ware. dis 10 c common Stamped Ware. dis 20 c apanned Tin Ware. dis 20 5 c apanned Tin Ware. dis 5 c dis 5 c dis 20 5 c	Plain	Ven
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000	Common Plain Brass Pall Ears	Wu. Whi
Se o	High Brass Scrap; 16 cents. Low "Beents. Gilding, 20 cents. Turnings, Filings and Chips, half the price of Scrap. Orders for Goods on this list received on or after this date, will be filled at the rate herein stated, Terms—Net cash. No discount allowed. Interest to	Yell
2 5 76	ANTIMON 16c. gold LEAD - DUTT: Fig \$4 per 100 lbs.; old Lead, 1% cent per 10. Fipe and Sheet, 2% cents per lb. Spanish.	Lins Wha Sper Seal Lard Cott
50 50 in the second	N.P. U	Nest Natu Aspl Benz Chal Dryg Floc Fros Glue
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et to	File Steel, Flat and \(\) itound 22\text{5c} Square and itound 22\text{5c} Mill 18\text{5c} Taper to 4 inch 16c Taue 1 and 2\text{5c} inch 18c SPELTER—DUTY: In Pigs, Bars and Plates, \$1.50	
et	Silesan, cash	
n	Banca. # b 26c., currency Strafts. # b 26c., currency English # b 26c., currency Tin Plates, currency Prices. A C 10x14. Prime Charcons. 826	
10	14x20, 4	
e c	C 10x14 Best. 2d Quality Ordinary 1 C 10x14 8500 7:35 7:00 & 7:25 C 12x12 5:00 8:21 7:00 & 7:35 1 C 12x20 8:75 8:25 7:36 7:75	2
c c c c c c	TERMY PLATE. Prime Char. 20 quat. Coke. I C 14x20. \$775 756 750 675 675 725 I X 14x20. 10:00 I C 20x23. 16:00 15:00 915:50 14:00 615:00 I X Jargs. 21:00 I C 20x20. 22:00 I C 14x20 M F. Brand. \$875	•
ccccc	ZINC.—DUTY: Pig or Block, \$1 50 per 100 lbs. Blueet 25c. # b. Bueet	•
000	Paper Stock, Old Metals, & c (Dealers' Selling Price.) (anyas linen	
	White itnen rags No.	
-	Oakum juns, No. 1. 5% as 5% Cass rope. No. 2. 6.4 Grass rope. No. 2. 6.4 Tarred Shaking. 1.1% as 1.4 Grass rope. 1.1% as 1.4 G	
	Canvas linen	"
	Copper	
	Paints, Oils, etc.	
-	Biack lamp—Coach Painters	
-	Orange Mineral 1% 6 4c Red Lead, American 14c English 10% 6 1ic Vengelsh 10% 6 1ic Vengelsh 1c, 2 dry Indian, dry off 1c, 2 dry	Plea

Comparison Com	Gum, Copal. Damar. Shellac, Knghish. dark. Litnarge. Pumice Stone, selected Lumps. powdered. Putty in bladders. in trulk. Rotton, Stone, soft, English. Spirits Turpentine. Whiting, Spanish. VERNCE WINDOW GLAS Prices current per box q180	.25 .35 .36 .46 .6 .6 .4 .33 .8 .8 .8 .32 .32
	Single Thick.	
enow Chrome		d. 3d. 4th.
Inc White, American No.1 dry 18 e 28c	11 x 14 to 16 x 24	975 8 6 25 8 5 7 7 7 7 25 6 5 7 25 9 7 6 5 7 7 7 7 25 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
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Spring	11 x 14 to 16 x 24 13.75 14 18 x 25 to 29 x 50 17.75 11 15 x 35 to 24 x 95 17.75 11 15 x 35 to 24 x 95 21 to 29 x 35 21 to 24 x 95 21 to 21 x 35 21 to	250 \$10°0 \$9°22 250 11°73 14°50 10°50 7°25 14°50 15°75 125 12°50 15°75 12°50 15°75 12°50 15°75 18°00
rrer, Pateut, Am'n	Sizes above 40 x 60—110:00 per hox extincines. An additional 10 per cent, will be charmore than 40 inches wide. All sizes a length, and not making more than 81 up be charged in the 84 united inches braci Discount 50&10 @ 50&195.	rged for all Glass bove 52 inches 'n
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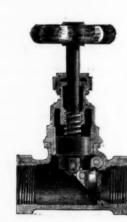
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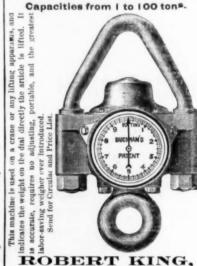
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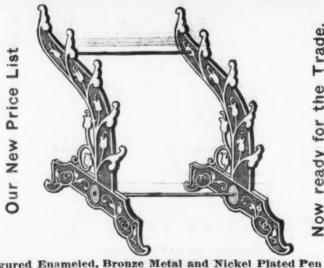
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Bourds -Stove, Brooks, Lat'dis 32 2 4 mos": 32%2 &	80 dy
Bolis-Stove.	dia 30 4
STICK-Bath (Dox of 2 doz) Best English	\$1.2
Bolas—Stove. Brooks 'Fat. (ile 35 % 4 mos.; 35% 5 % 100-Esta (by c. x of 2 doz) Best English. dis- Cases—Para (bol 1 doc. dis- Cases—Para (bol 1 doc. dis- Chaik—White, Carpenter's # gr Chisels—Firmer Socket. Framing Socket. Corner Socket Chisels. Silek's Carpenter's	55&10 4
Cases -Parior Coal Hod	dis 15 4
Chair-White, Carpenter s # gr	Oss. 576
Red. Carpenter's	900
Chisels—Firmer Socket	dis 70 4
Framing Socket	dia 70 s
Corner Socket Chisels	ats 70 4
Slick's Carpenters'	dis 20 4
Castings-Malleable	# Th O
Cocks-Globe and Bibb	dia 40 9
Cutters-Meat, "Hales"	85 4
Egg Beaters" Dover" per de	DZ 84'18
Elbows-Corrugated	01a 15 9
Adjustable, Springfield	dia 20 4
Files-Maischoss Bros	50&:10 t
Fluters-Geneva Hand 9 doz	. \$18·O
Freezers, Ice Cream-" Champion" di	a RRIC O
Hammers-Henry W. Kip's du	10.85
Corner Socket Chisels Silek's Carpenters' Castings—Malleable Cocks—Ghobe and Bibb Cutters—Meai, "Hales" Egg Beaters—' Dover" Elbert Cocks—Ghose Bibb Files—Maischoss Bros. Files—Maischoss Bros. Files—Maischoss Bros. Files—Geneva Hand. Freezers. Lee Cream—' Champion' di Hammers—Henry W. Kip's. dis Hinges, Gare—Shepard's. dis	NO#:10
Hinges-Window Bling-	overio,
Shepard s and Standard	20.8-5
Hods, Coai-Plain, Black and Galvan'd new Hat	dia 15
Funnel, Black and Galvanized	dia 15
Fancy and Helmet	dia 18
Gad Fuone	914
Kettles-Brass	
Kettles—Bress	D . 45
Kettles—Brass. Copper. "Hand Made".	D . 45
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Kettles—Brass. Copper. "Hand Made" Enameled. Kuives. Drawing—Oval No. 1. Bazor Blade.	15 . 45 400 dis 50 dis 70
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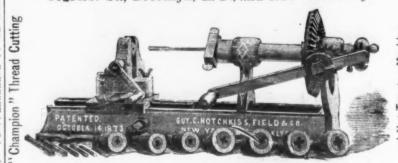
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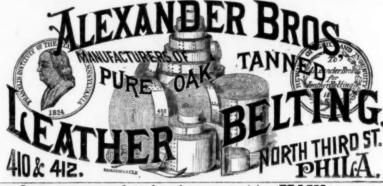
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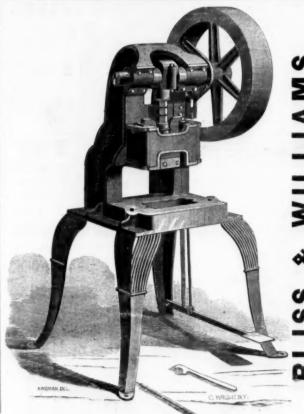
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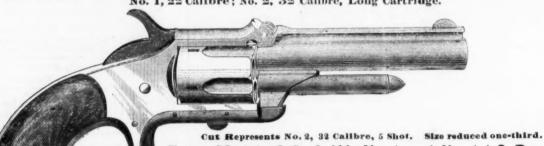


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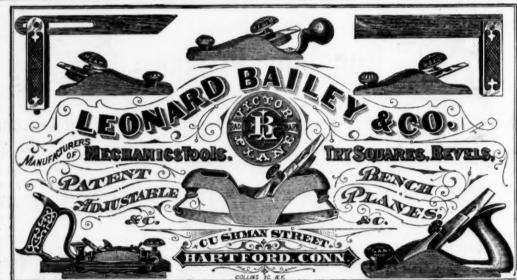
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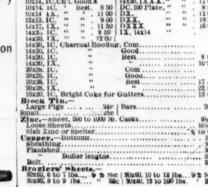
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Spofford's. dip 50 4 Brackets.—star bronzed new list net Star Japanned new list net store Shelf new list net	
Brushes Horse, Tatent Meta.lic. per doz. \$450 Brushes.—Horse, Patent Meta.lic. per doz. \$450 Butts.—Union Drilled Loose Joint. dis 352:10 & Wire Fast Joint. dis 352:10 & "Acorn Loose Joint. dis 452:10 \$ Brass Butts."	
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Parker's Farallel.	
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Walton	
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Boston Metal Market. (Corrected by Fuller, Dana & Fits, 116 North Boston, Importers and Commussion Mercha April 18, 1876 Fron.—Best Refined Bar Iron

S. A. Co. is make.	Wrought Scrap Iron " * tor, \$31 0
S. & Co.'s make 18c 17c	Wrought Scrap Iron.
18c	American Tool 14 c Tre
tal-F.S. & Co	Bessemer. 656c Tor Calk 946 Tin Pintes. 7 90x gold Copper. 7 7 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Common. Com. Charcoal. Juniata	I. C. C. 1. ce 10x14
4 c 5%c 6%c 9 c 9%c 9%c 11830 c	Pig Tin.— # B., gold Sneet Sc Ragea 28c Pipe 8.55
	Straits. 17 c Zinc.—Sheet. > 10 c English. 17 c Spelter. + 38%c
No. 1 Stained	ST. LOUIS.
Smooth S	Apple ParersConqueror
	A xes. — Wm. Mann's, Red Warrior * doz \$10 % Wm. Mann's, W. Stewart's 10 26
BOSTON.	Corrected seekts by Semple, Birgs & Co. Apple Parera, "Conqueror." put, \$1 in Hudson's Rotary. Axes. "Wm. Mann's, Red Warrior." pd dox \$10 it 5 km. Mann's, W. Stewart's. Hundled
Macomber, Bigelow & Dowse, 156 to 164	Hunt's James & Co. " 10 25
agle American". per lb. 10c; dis 20 % fairous Ship. dis 10 % den Ship. dis 10 % den Ship. dis 10 % den Ship. dis 10 % de dis 15 % dacket. 11 00 led Bine Jacket. 11 00 lees. — Wadlelgh a Oak % \$750. B (No. 1) \$700. C (No. 2) \$150 ♥ doz	Hunt's James & Co. "Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axies. dis 15 & 5 x Common Axies (Pat. Lubricating), 1½ inne and unward. e. b. c. do. less than 1½ incn. 65 c. do. "Britan Exc. 15 in. 12 do. "In prover! Amalgam Bronzed." 15 in. 12 do. 15 in. 12 do. "In. 16 to. "Britan Britan
len Ship	Common Axies (Pat. Lubricating), 1% inch and upward
led Blue Jacket	BellowsSes. St. Louis make
	17 in., \$2.50; 19 in., \$4; 21 in., \$5; 24 in., \$14; 27 in. \$19:50 Betting Boston Belting Co.'s Rubberdis 40 %
hburn'sper hundred set \$6 (0) friuge. Phila Girard Worksdis 60 %	Bonts - Metallic, Sectional, Bond's Patnew list net Boits - Arms, Bell & Co.'s Carriage & Tired's 70&10 5
ngle, Backus'	Butts.—Western Butt Co.'s new list— Narrow Fast Joint
Durn's per hundred sets #8 50	Narrow Fast Joint
- Star Bronzednew list net nednew list net	" Japanned and Silver Tipped
retsL. F. & C	eg do.
Wire Fast Joint dis 45&10 % Wire Fast Joint dis 25&10 % Acorn Loose Joint dis 45&10 %	Cider Willis. American Senior. \$3000: Am Junior. \$1950dis 30 % Corn Drill.—Campbell's Patent
Table Butts and Back Flaps als 30 % Tevesed list, dis 30 % arrow Butts reduced, dis 30 %	Corn Shellers.—Sandwich Mfg. Co.'s— Power Shellers.—dis 10 % Hand Shellers.—Special rates
arrow Buttsreduced, dis 30 % ds, No. X, per doz., \$0 35	Hund Shellers. Special rates Cotton Gins Carver, with 1e in. Saws, \$4:50 a Saw dis 22½ ½ 12 in. Saws, \$5:00 a Saw dis 15;4 Crow Barrs,—Steel Pointed b 6:40 Drag Saw Muchines.— Culver's iron Ding Saw dis 10 % Korinson's Patent Sweepstakes Sray Saw dis 10 % Kanning Mills.—Nash & Cutt's die 20 \$ Feed Cutterra.—Improved Burgick National, dis 30 % Sanford No. 1, \$11:00 : No. 2, \$8:40 Files.—Black Diamond, Mill. \$5:40 & currency Bastard 5:40 & currency Taper 5:40 & currency Forgras Allers Hornes Forge Co. 8. dis 12) 4 Forks says tioes.—
18, No. X, per doz., \$0° 35. dis 30 4° No. X. '0° 80. dis 30 8° No. 8X. '0° 250. dis 15 2° No. 9X. '0° 250. dis 15 2° No. 10. '0° 3° 50. dis 10 6° 8 '0° C. S. Cartridge Co. dis 60 5° Buck Bros." Shauk Goods. sadd 20 5° and 20° and 20	Crow Bars.—Steel Pointed. & B 642 Drng Saw Muchines.—
Buck Bros." Shank Goodsaud 20 %	Rottinson's Patent Sweepstakes Drap Saw. dis 10 & Kanning Mills.—Nash & Cutt's. die 30 &
nghtning— 18 4 5 6 gail per doz \$22 00 \$27 00 \$31 50 \$36 60 s and Bividers.—Bemis' dis 40 \$ dis 30 \$ \$4 \$5 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6	Sanford No. 1, \$11 00: No. 2, \$8: (0) . net Files, -Black Diamond, Mill\$5: (0) £ corrency.
and Dividers.—Bemis'	For grander Portable Forge Co.'sdis 12' 4
Manifa (usual trade dus.) # b. 14c Furred Hemp Lath 1 arn # b. 10g is iron. Steel Points # b. 5% c teel Bars # b 11c eel Bars # b 10c Extra Drill Steel # b 5% c Good & Mickel Plated dus 15 5 Legs. # dus 15 5	Taper. Seystone Fornable Forge Co. S. dis 12/ 4 Fortis and \$10cs.— Fortis and \$10cs.— Fortis and \$10cs.— Garden Seed Brandle Flore Co. S. dis 12/ 4 Fortis and \$10cs.— Garden Seed Brandle Flore Co. S. dis 12/ 5 Garden Seed Brandle Flore Co. S. dis 13/ 5 Garden Seed Brandle Brill, Nos. 2 and 3. dis 13/ 5 Combined Brill and Wheel Hoe dis 15/ 4 Combined Brill and Wheel Hoe dis 15/ 5 Sedgebeer's Nonsarell Mills. Grinding 14 His.—Challenge Freed Mills dis 15/ 5 Bracford's French Burr Mills. Let His. Hammers.— Masons Hammers. 4/ 8/ 10/ 5 Hunnifes.—No. 1 Fork, Hoe and hake. Smitths Hand. Smitths Hand. Harrow Freets.—1 inch fron. ### Brandle Grindle His Hop Co. Smitths Hoe and take. Harrow Freets.—1 inch fron. ###################################
teel Bars	Graden reed Drills and Wheel Hoes. dis 15 %
Extra Drill Steel	Grinding wills,—Challenge Feed Mills dis 15 % Grinding wills,—Challenge Feed Mills dis 15 % Sectorbeer's Nonnerell Mills dis 15 %
	Branford's French Burr Mills
	Handles.—No. 1 Fork, Hoe and Rake dis 8.5
U; 2 qtm., \$12 00 per dox. lden	% and % inch iron. 4% Barbed or Headed. %c extra
\$540 W currency le 20 %	Dederick 8 idsiroad. net list Perpetual. net list
Inaden & Clemson	Hay Knives.— Dunn Edge Tool Co.'s
; 5, \$2.50 • 118. 10 % • 2.50 2.50 2.50 3.25 per doz	Horse Hay Fork.—Nellis' Harpoon \$50 each net Horse Natis.—National Patent Pointed 200 rate National Patent Polared, extra finished 220 "
nge.—\$3.50 3.75 4.00 5. 5. 5. 5. 6 inch.	Horae Fowers.—Pitts or Carey's Patent
; 5, \$2:50 dls. 10 \$ 10 \$ 250 250 250 3:25 per doz nge \$-\$5, 55; \$4:00 7 lnch. -May dote 6 lnch. dls 12 \$, solid cast steel, adze eye, No. 1, \$10; 13,5:75 before, No. 1, \$4:00 15 ce. \$\$75. dls 12 \$ \$\$75. dls	Horse - hoes Rhode Island (Perkin's Pattern)
\$9.75	Deterrices Ratiroad
C Rollers.—Novelty	Hose.— Boston Belting Co.'s Rubber Medium Sizes, dis30&10 & Small Sizes, Hy-
	Mattocks and Grub Hoes. dis 40 %
-Underhill Edge Tool Co. du 20 5 s., warranted Cast Steel . 1, \$5:25 : 2, \$5:75 l. 9, \$4:75 l. 1, \$5:25 : 2, \$5:75 l. 1, \$5:75 l. 0. \$5:75 l. 0. \$5:75 l. 0. \$5:75 l. 1, \$5:70	Small Sizes, Hy dis 40 \$ Muttocks and tirub Hoes.— Klem, Logan & Co.'s Mattocks 4 dox \$11 75 @ 12 50 oval eye
trap and T, Stanlev Worksdis 60 is se and Fast Joint	oval eye 8 25 @ 9 7 Money Brawers.— Perpost & Co.'s Excelsior. per doz \$88 00 net Natis.— Weeling Riverside Braud \$28 00 net Packing.—Boston Beiting Co.'s Rubber, Prain. dis \$9 9 Boston Beiting Co.'s Rubber, Pure. dis \$5.5 2 No. 2 Piain. dis \$0.5 Round and Square. dis 10&10 8 Picks.—Klein, Logan & Co.'s Rib
oung's imp. Silverd Glassdis 45 % —1 unular No. 0	Boston Belting Co.'s Rubber, Pure dis 25 & 5 % No. 2 Plain dis 40 %
5) 5:50 lar 8:00 et, lee: Pipe, 9%c 1esa 10 % orwalk Lock Co. refuced list, dis 40&5 %	Picks.—Klein, Logan & Co's Rait- road and Clay
_	Poli, 11 60 @ 18 80
axe finish, long cutter	Picks Klein, Logan & Co. Stati- road and Clay
boitt	Missers Drift- Ing
Doitt. No. 1, 35c; \$, 25c; \$, 15c \(\psi \) b and larger \$\mathbb{z}_{\overline}\$ \) (\$\mathbb{z}_{\overline}\$ \) (\$\mathbb{z}	Post Hole Augers.—Clark s Patent— No. 1, 4 doz. 827; No. 2, 436; No. 3, 832
yersal Hatand Coat air wood—	Pulleys.—5 inch. per doz \$125 ne; 4 inch. per doz \$25 ne; Nellis' Patent. qui 20;
# gross \$250; \$1h., \$50; \$1h., \$50—dis to \$20. Levels.—Stanley	St. Louis. Farm, Patent Metal Lined new fist dis 25 1
Axie. . WheelNo. 150, 10c., 1 % in.; 16, 88c., 2 in.	Punips
e No. 18, 34c., 1 % In.; 26, 40c., 2 In. e No. 2, 42c., 1 % In.; 2, 50c., 2 In. t. Arie Bronzea Face 1 % In., 80c.; 2 In., 80c	Geo. Barnes & Co.'s Knives
Axle	Road Scrapers, Steet. each \$550 ne Cast Fon. dis 1025 -
Shear Co	Saws.—Curtis & Co
rersper foot 7c dis 30 % 10Fs—Helnz Patentdis 20 % 10ck dis 50 %	Extra Indian Fond. 750 Premium 10 500 Dismond Gail
10 Cooley & Cr. dis 30 'a	Sad J runs.—Monitor brand, Silver i olfabod. of B 4d Saws.—Curths & Co
er	do. M. Rowhand & Co., dis 30 and 32 and 32 do. O. Ames & Son, do 17 s and 5c
dadden & Clemson's, some list as "Dis- dis. 15&5 % dis. 15 %	Steel Face Polished
Andden & Clemson's, s.me list as ".Dis- Mis. 15&5 Mis. 15	See! Face! Toils
Am. Screw Co., new list Sept. 1st dis 60 %	Carriage and Express dis 125 3
One	Viscs.—Sond Box \$2.06 Wilsop Mfg. Co.'s dis 15 9
0ai, Rice, &c	Chambio Wood Wheel & doz \$35% Garden & doz \$40 net
gers" Partridge," original doz \$15 oco s Pattern, 20 in set; Parr's, 165 per doz	Coes Pattern
P. & Co.'s Solid Hox. Blacksmith is in the	Iron Axic
	St. Louis Metal Market.
" Parallel	Corrected Weekly by Mears. R. Sellem & Co.) Tin Plate. [C, 10x14, Best Char. \$ 900 1X, 14x20. Roofing \$11 co.
spools, No. 23 to 40 assorted # gross \$3 50 ting.—Clinton Wire Cloth Co., Green. # ft 5c	1C, 12x, 2, " 951 1X, 20x28, " 225) 1X, 12x12, " 12 0 1C, 10x14, Coke 901
-Genume wrenches, G. A. Coesdis voca v	(Corrected Weekly by Mearrs, R. Sallem & Co.) This Pinte Char, 8 year IX, 14x20, Roofing . \$11 \cdot IX, 14x20, Roofing . \$11 \cdot IX, 14x20, Roofing . \$11 \cdot IX, 14x20, Roofing . \$15 \cdot IX, 12x12, 15 \cdot IX, 25x28, 22 \cdot IX, 25x22, 22 \cdot IX, 25x24, 22 \cdot IX, 25x24, 22 \cdot IX, 12x14, Color Size IX, 14x20, IX, 14x20, IX, 14x20, IX IX \qu
dis 50 %	Biock Tin. Strait's, Large Pigs24c do, Smail
Tub No. 2Less thau doz, \$72 (0) al Tub No. 22 doz or more, 70 002 doz or more \$88 (0)	Block Tin Start's, Large Pigs 25c do. Smail 25c Eng. Refd, Large Pig 24c Bar 26c Sheet Zinc Eng. Refd
. " 114 00 " 111 00	Solder.
Cooley & Co.— 60 0) 58 00 cs, Forks, &c	No. 1, in Dars
Boston Metal Market. 1 by Fuller, Dana & Fitz, 110 North Street,	Rooms
Importers and Commission Merchants.) April 15, 1876 Refined Bar Iron	Tinned, 14x48, 14 and 16 oz. 34 Pianished, 14x48, 14 and 16 oz. 39c Botter Sizes, 14 and 16 oz. 41c Conner Rottoms. 41c
ar iron gold " 105 59 hapes gold " 117 50 all icods gold " 122 59	Copper Bottoms 446 Sheet Iron Com'n Sm'th Char'i, in la
napes gold 117 be all tiods gold 122 52	No. 22 to 24. 4 c 4 c 6 c 7 kc No. 25 dt 26. 4 c 6 c 6 kc 6 c c
The state of the s	Calvanized Sheet Iron die 36 c 8% die 36 c 1 c 3
	Copper Rivers and Burs dis 20 3 Genuine Russia Iron.
Found, y, No. 1 extra	Copper Botton Copper Botto



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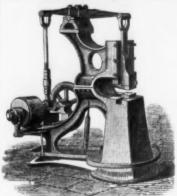
are above or below the water level in Bolier, thus doing awa with pumps and other mechanical devices for such purposes. Apply to

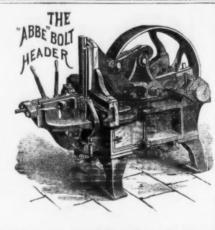
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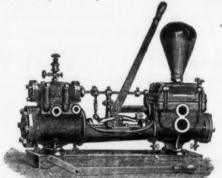
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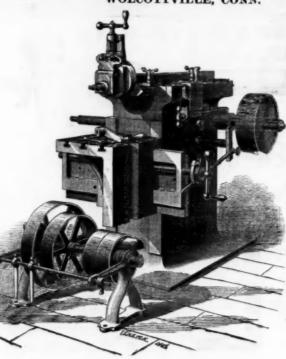
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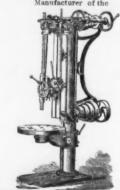
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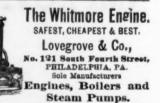
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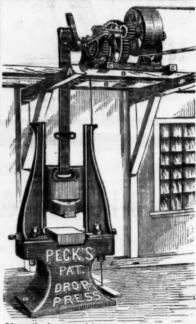
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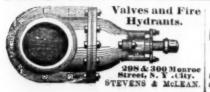
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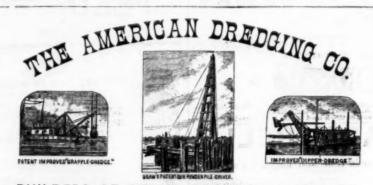
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REPORT OF JUDGES

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No. 318, Drawing, Drop & Punching Presses.

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The machinery exhibited by these makers is of a character that calls for special commendation. In addition to their well known punch ng presses, twithin a new feature has been added in a press adjustable to an inclination for discharging work left above the die, there are exhibited by them a combined punch and shears, a drawing or blanking press, and a drop.

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Your committee would unbesitatingly recommend for this exhibition the "Medal of Progress," but find such award debarred by the rule of the Institute, forbidding such award unless a Silver Medal has been previously awarded we, therefore, respectfully recommend the award of a Silver Medal.

Silver Medal Awarded.

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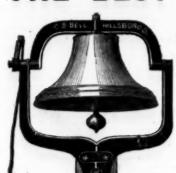
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